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ANNUAL BUSINESS MEETING.

Everything is now in readiness for the Annual Business Meeting to be held in the Chateau Laurier, Ottawa, on Wednesday, February 4, beginning at 10 a.m. It is hoped there will be a good attendance of our members, as in addition to the review of the work of the year, the election of officers, etc., several important matters will be discussed for presentation to the Government during the course of the day. The Canadian Lumbermen's Association meets on the preceding day, concluding with a banquet in the evening.

THE MAPLE SUGAR INDUSTRY.

Attention is directed to the article in this issue by Dr. Geo. Fisk, of Montreal, who, as the developer of a maple sugar grove on modern lines, shows what can be done with rough and hilly lands, which are entirely unsuited to other crops. There is so much of this kind of land in Canada that the possibility of developing it in the way indicated by Dr. Fisk is of the greatest importance to Canada. We trust our members will give it a careful reading.

COMMISSION OF CONSERVATION.

A number of matters of interest to our members were dealt with at the meeting of the Commission of Conservation in Ottawa Jan. 20 and 21. A report of this meeting will be found on another page. Of particular weight are the remarks of the Chairman of the Commission, Hon. Clifford Sifton, in regard to the

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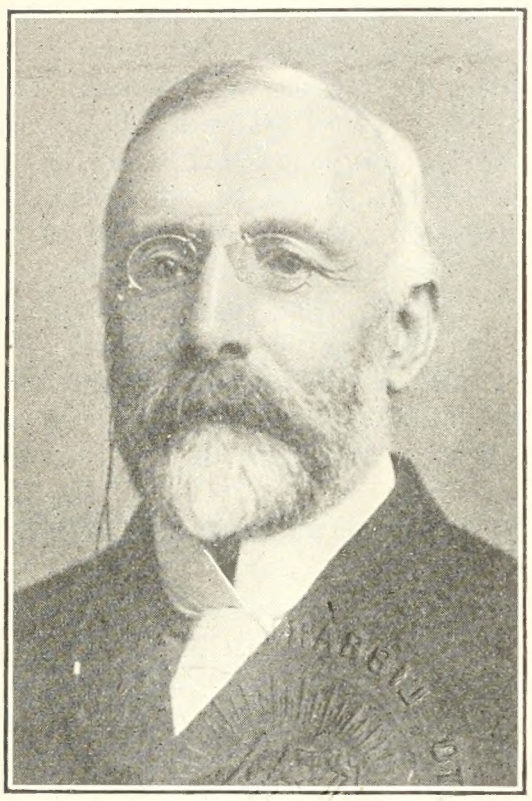
need for the extension of Civil Service regulations to the outside Civil Service, and also in reference to the co-ordination of the work of the various branches handling Dominion forest matters, which he considered necessary in order to secure the greatest efficiency.



MR. AUBREY WHITE, C.M.G.

Among those who were honored by His Majesty King George the Fifth on New Year's Day, 1914, was Mr. Aubrey White, who was created a Companion of the Order of St. Michael and St. George (C. M.G.) Mr. White entered the Crown Lands Department of Ontario in the outside service in 1876, and was made Deputy Commissioner in 1887. Later, when the office was enlarged and the title changed, he was made Deputy Minister of Lands and Forests, which is his present office. Mr. White has been a pioneer in the matter of forest conservation, having recommended and organized, in 1885, the first forest fire protective patrol system on the continent. Mr. White is a Past President of the Canadian Forestry Association, and is one of its most active Directors. His reports and bulletins always receive the most careful consideration from forest administrators. For over a quarter of a century he has been the administrative head of the Department producing the greatest part of Ontario's revenue, and one of the largest forest services in the world. The Toronto News thus refers to Mr. White's new honor:

'The New Year honor conferred upon Mr. Aubrey White was thoroughly deserved. Civil servants in this country are none too richly recompensed in a material sense, and the prerogative of the Crown is well employed in seeking out men like the Deputy Minister for special distinction. Under Liberal and Conservative Governments alike Mr. White has labored long and faithfully in the public interest. He is one of the most capable administrators in the Province, and in decorating him the Sovereign has recognized the whole civil service afresh in a gratifying manner. Mr. White will wear his C. M. G. with becoming dignity.'

Within the three National parks in which the Dominion Government maintains the buffalo in a state of semi captivity says the sixth annual report of the American Bison Society, there were at the end of March, 1913 1,287 buffalo. The number of males was approximately the same as the number of females, a larger number of the former being aged. The total number of calves successfully raised during the year was 221. An estimate of the number of wood bison in Mackenzie River territory and of those loaned by the Dominion Government to city parks, etc., makes the total number of pure bred bison in Canada about 1,600.

Owing to the crowded state of the columns of the *Journal* this month, several articles dealing with forestry in British Columbia and Ontario had to be held over until the February issue.

Mr. H. A. Preston of Massey, Northern Ontario, writes condemning the carelessness that is often responsible for the spread of, destructive forest fires and suggesting that the Government be more strict in enforcing the law prohibiting settlers setting fires during the months of June July and August.—*Rod and Gun.*

Possibilities of a Modern Maple Grove

By Dr. George Fisk, Montreal, Proprietor of Maple Glen Reserve, Magog, Quebec.

The Canadian Forestry Association is authority for the statement that 50% of the land in the Dominion of Canada is fit only for growing tree crops. The many deserted farms in the outlying districts of the Province of Quebec tend to confirm this opinion, for if we investigate why these farms have been deserted, we learn that as soon as the lumbermen had cropped the neighboring lands of the best lumber, the outlying farmers found it difficult to make a living from handling crops without the aid of the tree crops. A move to a new farm in an unlumbered district provided him with profitable work for the whole year. These farms that have been deserted in this way have soon grown up to a second growth, principally of the hard wood varieties, and in many cases with a very large percentage, if not a pure growth of maple. It would appear, then, if lumbering was at one time profitable, and the annual crops were not sufficiently profitable to retain the farmer, that the question of reforesting these farms warrants very careful consideration.

In districts of sandy soil the pine tree is the favorite for replanting, and should be a commercial success. However, the investor could not hope to realize a return on the investment in less than sixty years, the average time required for a pine tree to grow to a diameter of 18 inches. This proposition is hardly

View in Dr. Fisk's Bush, Showing Metal Sap Pipes.

attractive to the farmer who must of necessity count on an early return from his investment. The only natural forest tree in Canada which may be cropped while it is slowly growing to maturity for lumber is the maple tree. This may be tapped with profit for the production of maple sugar after it has grown to the size of six or eight inches, and so provide a revenue long before it is large enough to give the best returns as lumber. In twenty-five or thirty years after a tree the size of a broom handle has been transplanted, it should yield a very profitable return for the time and money invested.

The most suitable locations in this Province of Quebec for maple groves are along the ridges and hillsides, and it is not difficult to find many hillsides gradually sloping, which have been cleared or partially cleared, and are now grown up to thickets of hardwood, in which maple largely predominates. Mr. R. H. Campbell, Director of the Forestry Branch of the Department of the Interior, concludes an interesting comparison between the pine tree and the maple tree as follows: 'When one considers the revenue derived after the thirtieth year from the sap, and the higher prices obtainable for thinnings as fuel, or making acetic acid, wood alcohol and charcoal, there seems but little doubt that the maple would in the end be the more profitable tree. This is particularly true in the case of the small wood-lot owner, or farmer, who has many uses for the wood, and especially where the maple already exists in the stand and natural reproduction can be secured.'

Let us examine this problem of a maple orchard ideal in location, arrangement and outfit for producing maple sugar of the highest quality at the lowest possible cost. To produce an article economically is, of course, to produce it in fairly large quantities. It is, therefore probably wise to develop as large an area as possible in one sugar orchard. The chief expense in administering a sugar orchard is in gathering the sap from tree to tree. The quickest and most economical method of doing this is by gravity through a system of pipe lines. The orchard preferably should be placed around a sloping hillside, not too rough or steep for the necessary road where teaming is needed, and this entire slope should focus at some point lower down, where the sugar cabin and storage tanks should be placed.

It is not difficult to find in this Province of Quebec many suitable areas in which more than 30 or 40 acres of hillside are tributary to a suitable point for a sugar cabin. If we take, then, for illustration, a unit of thirty acres, sloping preferably to the east or southeast, we would in time be able, by proper planting, to have an orchard of 4,000 trees or more, estimating 133 trees per acre. This should mean 4,000 buckets, or, perhaps, more, if some trees are large enough to permit of more than one bucket. If this area contains maple trees already, it simplifies the undertaking very much, as it will not be necessary for the owner to wait twenty-five years for the full maturity of his orchard. If the other varieties of wood are first cleared out, and the vacant places filled by planting young maples where necessary, the orchard will go on improving year by year.

In considering the economical administration, small subsidiary cabins should be built at convenient points to allow for the storage of tanks, covers, spouts and piping, each cabin to contain from 500 to 1,000 buckets. This facilitates tapping in the early spring, when the snow is deep and the transportation is difficult. With a system of two-inch galvanized sheet iron pipe in 10 ft. lengths, which can be placed in position on a series of posts, or suspended from a

View of Inside of Sugar House, Maple Glen Reserve.

line of barb wire, so as to be easily taken up after the season is over and stored in the cabin, all long hauling of sap is obviated. The collector of sap, with a neck yoke and two pails, gathers the sap from tree to tree, and empties it at pleasure into the nearest pipe by means of a connecting hopper. The sap flows direct to the storage tank, and the collector wastes no time in needless journeyings to the storage tank. With a complete line of piping, it is never necessary for a collector to travel more than a few yards before emptying his load. A good man should be able to gather all the sap from 600 to 800 trees each day in this way.

It is very important that the evaporating outfit should be ample for the size of the sugar orchard. We see all too frequently small evaporating accommodation, necessitating much overtime work. The largest evaporator at the present time on the market is a 6 ft. x 24 ft. This is not at all unwieldly, and can be operated by one man with little more trouble than one of one-fourth the area. In most sugar orchards this size should be ample for an orchard of 4,000 trees, by providing a night shift for boiling. The next point is to provide large buckets, covers, and satisfactory spouts to give the best possible returns from each tree tapped. It is a frequent observation that small buckets waste one-half of the sap which flows, and that uncovered buckets in rainy weather waste nearly all the sap.

It has been estimated that about 9% of the sugar content of the maple tree is obtained from a single tapping. It is also an opinion of experts that if 20% could be obtained no damage would be done to the tree. If some way is devised by which an increased flow could be obtained it would increase the commercial returns materially.

In administering a sugar orchard

A Gala Day in a Sugar Bush at Algonquin Park, Ontario.

it is a well known fact that if the orchard is concentrated over a small area it is much more economical than where the trees are wide apart. Careful reforesting of the barren areas in the orchard will, in time, give an ideal orchard for economical administration.

There are many points in the cabin and woodshed which may be adjusted for economical administration. A large evaporator will frequently absorb three cords of wood during the day. This is a lot to bring in by the armful. An overhead rail from the woodshed with a truck suspending platform will simplify this very much. There are many other similar points of economy which we will not mention.

Let us estimate, then, the results at the end of twenty-five years after careful reforesting that one would expect to obtain. With an area of thirty acres, averaging 135 trees, or 135 buckets to the acre, and one large evaporator, it would be possible for six men to administer this with comparative ease. The average annual return should be about two pounds of sugar per tree, or one gallon of syrup to five trees. If a high quality of sugar and syrup were made, as it should be under these conditions, a high price should be obtained for the product, at least $1.50 per gallon, for the syrup, and 15 cents a pound for the sugar, on an average. This should show a gross return of $1,200 per annum. Allowing an ample wage list of $300, the depreciation of plant of $100 (which is over generous), the net returns would be $800, or $20.66 per acre, which is a very good return for what is now waste land.

The labor problem, of course, is a very important factor in any estimate of this kind, but the sugar season is a quiet one with those who work on the farm and in the lumber woods, and with proper accommoda-

tion for the men, preferably in the sugar orchard itself, it should not be difficult to provide and retain adequate skilled labor. To many a farmer who has a wood lot and taps a few trees that nature has given him, the return is not large for the labor, but the same thing prevailed in the apple industry, when the farmer attempted to sell a few seedling apples from accidental fruit trees about the fences and clearings. To-day select orchard lands are planted, drained, cultivated, and carefully tended, and I am free to say that, considering the initial cost of suitable apple tree land, and the subsequent expense of planting and caring for the orchard, the return is not greater, nor the investment more secure, than would be a maple orchard well located and well administered. Furthermore, much of the land suitable for maple trees is quite unsuitable for fruit trees, and young maple trees are found on every hand ready for planting, and require no spraying or cultivating. The necessary capital to plant a maple orchard is far below the amount required to plant a fruit orchard.

If our Government should wisely limit the use of the word 'maple' to absolutely pure maple products, it would then be a perfectly safe commercial venture to reforest many of the waste areas, and develop those gorgeous maple groves which are at once the glory and salvation of our northern hillsides.

Commission of Conservation

Fifth Annual Meeting a Notable Event.

The fifth annual meeting of the Commission of Conservation of Canada was held in the Board Room of the new offices of the Commission, Masonic Temple, Ottawa, on Jan. 20 and 21. The Chairman, Hon. Clifford Sifton, who was unavoidably absent last year, occupied the chair, and the proceedings throughout were of the most interesting and important character. The meeting opened with the address of the Chairman, in which he reviewed the work before the Commission. The headings of the different paragraphs indicate the wide scope of this important pronouncement. These are: Water and Water Powers, Fisheries, Game and Fur Bearing Animals, Oyster Culture, Minerals, Agriculture, Agricultural Survey, Illustration Farms, Public Health, Town Planning, Forestry, The Trent Watershed Survey, Fire Protection, Investigation of Forest Resources, Forestry on Dominion Timber Berths, Permanency of Forest Service.

Address of Hon. Clifford Sifton.

As the address of Hon. Mr. Sifton would in itself fill nearly the whole of this issue of the *Journal*, it will be possible, on this occasion, to give only a few of his most striking points in regard to forestry. In dealing with the cut-over territory in the Trent watershed of Ontario, he suggested Dominion, provincial or municipal ownership of the territory in question, the redrafting of regulations governing the timber limits still active there, and the appointment of a forester to have charge of the region. Fire protection work along the railway lines (under Mr. Clyde Leavitt acting for the Dominion Railway Commission and in co-operation with the Dominion and provincial forest services), was gone into with great care. The results which had been secured by the co-operative handling of the railway fire protection work had been admirable. In the West practically no criticism could be made in this matter. The eastern provinces were more conservative and completion of the organization was slower. However, assurances received indicated a much more satisfactory organization in the East in 1914. For the most part, the railways had endeavored to comply honestly with the various requirements. In order to complete the work of fire protection along railways, further action was necessary respecting lines not under the Railway Commission. These were the Government railways and the provincially chartered railways. New legislation was required regarding provincial railways, and increased administrative action in regard to

Dominion railways. The situation along Government railways had shown marked improveemnt during the year, but much remained to be done before the system would be as intensive as that now required on lines subject to the Railway Commission. The suggestion had been made to the Minister of Railways and was now under his consideration, that the Government railways be placed under the regulations of the Railway Commission.

Forestry on Dominion Timber Berths.

In discussing 'Forestry on Dominion Timber Berths,' Mr. Sifton said:

'During the past summer attention has been given to forest conditions on the public domain in Alberta, Saskatchewan and Manitoba and the Railway Belt of British Columbia. In this work particular attention was paid to the matter of fire prevention through brush disposal, and to the question of securing a natural reproduction of the forest through control of the methods of cutting. In addition to certain technical features, the question of organization is involved, owing to the fact that jurisdicion of the timber lands of the Dominion Government is divided between three separate branches of the Department of the Interior.

'As to the timber berths, responsibility rests upon the Timber and Grazing Branch, which is to a large extent in practice, a fiscal organization, charged with such work as the collection of revenue, the prevention of trespass and the administration of grazing leases.

'The question of brush disposal as a fire preventive measure, and of so controlling the methods of cutting as to ensure the perpetuation of the forest, are the principal technical features of present-day forestry practice. Provision for these matters is made in the licenses covering all timber berths, but, unfortunately, none of the branches of the Departments having to do with Forests have at work a sufficient staff of trained men to enforce these provisions. The Crown Timber Agents and their office staffs are obviously unable to devote any personal attention to these matters in the field. The Inspectors under the Crown Timber Agents are the only men upon whom this work can fall under the present plan of organization. Of these, there are one at New Westminster, one at Kamloops, one at Calgary, six at Edmonton, four at Prince Albert, and five at Winnipeg. The time of these men has previously been fully occupied with the duties regularly incident to their positions, and it is hopeless to expect that anything like adequate results can be accomplished by trying to impose upon these already fully occupied men the responsibility for the enforcement of the technical forestry provisions of the licenses. These provisions have not been enforced in the past on the licensed timber berths, nor can they by any possibility be enforced without the appointment of skilled officers especially charged with this duty. Thus we have the anomalous situation of a lack of technical supervision of logging operations upon lands containing the greater quantity of the accessible merchantable timber which is now the property of the Dominion Government.

'The particular way in which the remedy should be worked out is, of course, strictly a Departmental matter. The main consideration is that the results ought to be accomplished in some way.

'The above remarks are not intended, and should not be considered, as an unfriendly criticism. The situation simply appears to be that no effective provision for the administration of forestry regulations upon the timber berths of the public domain has yet been made. As a result, the protection and perpetuation of the forest upon the best timbered areas, both within and outside the forest reserves and parks, is most seriously endangered.

'While this is the case it gives me pleasure to draw attention to the excellent work of the same Department in connection with other branches of forestry work, the care of reserves, prevention of fire and the encouragement of tree planting. There seems no reason to doubt that the officers of the Department will make effective use of any powers bestowed upon them.

Permanence of Forest Service.

'Following the last annual meeting, representations were made to the Dominion and Provincial Governments favouring the extension of the merit system of appointment in forestry and fire-protection work.

'I regret to say that as yet very little has been done toward carrying out the recommendations made. With regard to this measure it is essential that the Commission should not cease to reiterate its views. Whatever may be said of other branches of the service, it is an unquestionable fact that not even a moderate degree of efficiency and economy can be attained in forest service without a permanent and specially trained staff.

'It frequently happens that men appointed in the ordinary political method from business life make very good officers while they have to deal only with collection of revenue and with what has heretofore been considered the usual work of a Crown Timber Officer, but, as fire rangers and supervisors of forestry regulations, such men are, when first appointed, absolutely useless. They will learn if they devote themselves to the work and stay long enough in one position, but at best such a system is extravagant and inefficient.

'At this stage of our work the prime necessity is to get the Governments of the Dominion and the Provinces to place the forestry staffs upon a permanent basis providing for appointment and promotion only for merit and qualification through the Civil Service Commission.'

Other Forestry Work.

The other items on the program directly referring to forest conservation were as follows:—'Work of the Committee on Forests,' by Mr. Clyde Leavitt; 'Forestry Work in the Trent Watershed,' by Dr. B. E. Fernow, and 'Work of the Dominion Forestry Branch,' by Mr. R. H. Campbell. Mr. Leavitt's paper was a review of the work of the year on the lines of his report for 1912, which was reviewed in the *Journal* last month, and a report of this will be printed later.

Dr. B. E. Fernow, dean of the Faculty of Forestry of Toronto University, in his report on the Trent watershed, showed the serious consequences which have followed the agricultural settlement of a district which, for the most part, was essentially non-agricultural in character. The soil having quickly become impoverished from cultivation, the people who remained on the poorer lands were existing under undesirable economic conditions. Repeated fires had destroyed a young growth having a potential stumpage value of millions of dollars, besides facilitating erosion and so changing the composition of the forest that its possible future value was greatly decreased.

Moreover, the destruction of the forest had had a very detrimental effect on the water supply of the Trent Canal. This was a question of serious import to the Dominion Government, which had already spent something like $10,000,000 on the canal project. The provincial government

had also a great interest in the matter, since it still controlled approximately one third of the area in question. The problem of efficient fire protection and of the reforestation of the non-agricultural areas was so important as to justify a conference between representatives of the two governments, looking toward the adoption of a definite co-operative plan for its solution.

Mr. R. H. Campbell, Dominion Director of Forestry, made a brief statement covering the work of the Dominion Forestry Branch, which will be published later.

Among the members of the Canadian Forestry Association who attended the meeting were Senator Edwards, Ottawa; Mr. W. B. Snowball, Chatham, N. B.; Sir Edmund Osler, Mr. J. F. MacKay, Dr. C. C. James and Mr. G. F. Beer, of Toronto; Hon. J. A. Matheson, Premier of P. E. I.; Dr. C. C. Jones, Chancellor of the University of New Brunswick; Dr. Howard Murray, Dalhousie University, Halifax; Lt.-Col. Jeffrey H. Burland and Dr. Frank D. Adams, Montreal.

Recommendations of Committee on Forests.

The recommendations of the Committee on Forests which, were signed by Hon. W. C. Edwards, Chairman, Dr. B. E. Fernow, and Mr. W. B. Snowball, were adopted as follows:

The Commi tee on Forests finds that, since the last annual meeting, the situation, to which its [illegible] most of the propositions then formulated, with some additions.

1. [illegible] assiduous effort to make it effective in all direc-

2. The matter of fire-protection along Government railways should be further taken up with [illegible] should be made subject to the fire regulations prescribed by the Board of Railway Commissioners for lines subject to its jurisdiction.

3. Representations should be made to the Governments of Nova Scotia, New Brunswick, Ontario and Alberta, urging that both legislative and administrative provision be made for requiring provincially chartered railways to take adequate steps to safeguard the adjacent country from fires due to railway causes.

4. The ascertainment or inventory of timber supplies has been properly begun in British Columbia, in co-operation with the Provincial Forest Branch and with the Forestry Branch of the Canadian Pacific Railway, and in Saskatchewan in co-operation with the Dominion Forestry Branch. This work should be persistently continued. Co-operation of the provincial government of New Brunswick for the same purpose should be encouraged, and the governments of Ontario and Quebec invited to pursue a similar course.

5. The attention of the Dominion and Provincial Governments should be again drawn to the vital necessity of withholding from settlement all lands which canno properly be classed as agricultural, and of setting such lands apart for the permanent production of timber supplies. The importance should be especially accentuated of reserving and protecting from fire the vast areas of young forest growth, in order that they may

Antiquated Systems of Boiling Still in use in Backward Sections.

reach merchantable size and form a future source of local revenue and industry.

6. The Governments of Ontario and Quebec should be urged to undertake a systematic classification of land in the Clay Belt in advance of settlement, in order to have settlement properly directed.

7. A strong effort should be made to secure co-operation between the Dominion Government and that of the Province of Ontario, to solve the problem of protection and recuperation of the Trent watershed.

8. The extension of forest reservations in the public lands of the west should be forwarded, as the surveys by the Dominion Forestry Branch develop their desirability.

9. The organization of forestry branches should be urged on the two forest provinces, New Brunswick and Nova Scotia, which are still without such an agency.

10. The Commission reiterates its opinion that in the forest services of the Dominion and Provincial Governments, more than in any other service, the appointments should be based on capability and experience, such as may be secured by civil service examinations.

11. Representations should be made to the Dominion Government looking toward the adoption of some plan, whereby adequate provision may be made for the enforcement of the technical provisions affecting lumbering operations on the licensed timber berths.

12. The immediate establishment of a game preserve in the southern portion of the Rocky Mountains, in Alberta and British Columbia, adjacent to the Glacier National Park of Montana, should be urged upon the Dominion Government and the Government of British Columbia. Immediately favorable action upon this recommendation is imperative in the interests of game preservation.

13. In the opinion of the Committee, an expenditure of $25,000 per annum for the next four years is urgently needed, to furnish the basis for formulating and forwarding a forest policy for the Dominion.

14. In view of the importance for water power development of the forest cover on the upper waters of the Winnipeg River, and especially on the watershed of the Lake of the Woods, steps should be taken to secure a forest reservation on these headwaters, and to segregate as a forest reserve the area drained by this river.

GIVING AWAY NATURAL RESOURCES

Nothing could more clearly demonstrate the folly of permitting the Government to part with the natural resources of the country than the experience the United States is now passing through. The Government of that country for many years seemed to be mainly engaged in giving the resources away for a mere song to private interests.

Every cent's worth of the natural advantages of that territory belonged once to the Government as represented by the people. Had they been conserved as they should have been, they would have been owned by the Government to-day, and those who wished to exercise their industry in taking the raw products from the earth and finishing them and selling them to their customers would be doing so just as they are to-day—but the Government, instead of particular individuals, would be receiving the annual value or rental of the resource itself. The revenue from this would be greater than the United States Government ever enjoyed. But because private ownership of a common heritage has been permitted, the annual value goes to private pockets, and the Government must resort to iniquitous methods, such as imposing income taxes and taxes on the industry of the citizens at large, in order to raise its revenues.

Canada still has much of her natural resources. She can no longer sin in ignorance, with the United States going through the agonies of a readjustment of economic relations right before her very eyes. But in Canada as in other countries each citizen is looking after himself. If you or I can see a chance of grabbing a timber area or an iron or coal area or a waterfall we will undoubtedly do it if the others will let us. So long as they, the plums, are available, and we have a chance to get them we would be fit for the asylum if we did not take them. Hence, we cannot object if someone else gets them. There is nothing to be done, consequently, but to fix it that neither we nor anyone else may get them. In the interests of all and as a most important measure for the protection of the present as well as of the future, the sale of the natural resources of whatever nature of the country must stop finally and for ever.—*Toronto Saturday Night.*

VIEWS OF MEMBERS.

There has been an unusual amount of correspondence of late and the tenor of it indicates a steady growth in forest conservation sentimnet throughout the country. A few extracts are appended.

From an Ontario Senator

I have read with a great deal of pleasure of the meeting held in Winnipeg, during the summer. . . I read about the Manitoba timber, and I trust that the Association may go on to even greater things in the future.

From a Lady Member

You may be sure we are interested in the work being done by you and we wish you the best of success in it.

From a Montreal Manufacturer

I am pleased to notice the good work your Association is doing. It is certainly a very necessary one in Canada at the present time.

From a Winnipegger

Enclosed herewith find $1 annual fee for membership in the C. F. A. You have my warmest sympathy in the work, and I will do what I can to forward this very important development in the wealth of our great heritage.

The Dominion Forestry Branch

Past, Present and Prospective Developments.

When, in 1900, the Honourable Clifford Sifton, then Minister of the Interior, asked for a grant of $15,000 to establish a Forestry Branch, the proposal met with considerable opposition in the House. It was an experiment, the success of which was doubted. But from the very start the Branch amply justified its existence, and each succeeding year has seen an amplification of its activities. In the short period of thirteen years a forest fire protection system has been developed, which, measured by results, is second to none on the continent; forest surveys have been carried on, which have revealed the previously unknown timber resources of the Canadian West, and have secured the setting aside of thirty-six thousand square miles of Dominion forest reserves; a Tree-planting Division has been built up, which annually distributes more trees for prairie planting than any similar agency in America, and, exclusive of the annual Branch Reports, over forty comprehensive bulletins have been published, containing information on Canada's forest resources and the industries dependant thereon, of acknowledged value to layman, lumberman and forester alike.

The year of 1913 was marked by the greatest progress in the history of the Forestry Branch, due, in large measure, to the appropriation for forestry purposes being increased to $541,720, almost double that of 1912. This permitted a large increase in the personnel, which had a summer strength in 1913 of over 400, of whom 27 were technical foresters. It also made possible the carrying out of proposed improvements, the extension of fire-patrol, and the developments of new phases of forestry work. 'Perhaps the most outstanding feature of the development of Dominion Forestry work recently,' as pointed out by Mr. R. H. Campbell, the Director of Forestry, 'has been the consolidation of the forest reserve administration on a well organized basis, and with a fair proportion of scientifically-trained foresters, with the result that it will be increasingly possible to apply good forestry methods in the handling of the timber and other resources of the reserves. This is a development made possible by the fact that technical training in forestry is now being provided by some of the colleges in Canada, and when this is supplemented by ranger schools, in which the forest rangers can also be given special instruction, it should not be long before the Dominion Forest Service will be as well organized an institution as in any other country which has reached the same stage of development.'

Mr. Finlayson, Chief Fire Inspector, refers to this 'distinct improvement in organization and administration' as the chief reason for the remarkably low loss from forest fires on Dominion forest reserves and fire-districts in 1913. On the Rocky Mountains Forest Reserve, which has an area larger than that of all the reserves in Ontario combined, the total value of the mature timber reported destroyed by fire was only $150. Even in the fire-districts, where the fire-rangers were unaided by lookout-towers, telephone lines, trails, fire-guards and other fire-fighting facilities found on the Reserves, the fire loss was the lowest on record. It is true that rains were frequent, but so were also fires. In one district in the Railway Belt of British Columbia, 110 fires occurred during the three summer months, yet owing to the alertness of the patrol, all were extinguished before any damage was done to standing timber. It is probable, when complete records are available, that the area burnt by forest fires, and consisting principally of natural meadows and cut-over land, will not exceed one-fiftieth of one per cent. of the total area of Dominion forest lands under protection, a result even better than that attained by the United States Forest Service, which also had the most successful fire season in its history.

In the summer of 1913 the Dominion Forestry Branch had eleven survey parties in the field, and over 15,203 square miles of wooded country were examined, at an average cost of only eighty-nine cents a square mile. The technical foresters in charge of these parties are qualified to report not only on the forest conditions, but also on the geology and character of the soil in the regions examined, and if the latter is clearly unsuited for agriculture the area is recommended to be reserved in order that the young trees may be better protected from fire, which, in the last fifty years, has destroyed over half the original stand of timber on the area examined by the Branch. This area comprises about 25% of a belt from 40 to 150 miles wide, stretching from Lake

Winnipeg to the British Columbia boundary. In the Railway Belt practically all of the Coast District and the Dry Belt has also been examined by Dominion foresters.

Approximately three million trees were distributed in 1913 by Dominion Forestry Nursery Station at Indian Head, making a total of twenty-four million trees furnished by it to the settlers on the western prairies. The trees chiefly planted are green ash, Manitoba maple, cottonwood, willow and Russian poplar; and of the conifers, spruce, larch and pine. In 1901 only four acres were devoted to tree-culture at Indian Head. Sixty-seven acres are now required, and there has been such an increase in the demands for trees that a branch nursery was established in 1913 at Saskatoon, which will take a share in the distribution of tree seedlings this coming spring. Smaller nurseries have also been developed on some of the reserves to provide trees for reforestation. The Spruce Woods nursery now contains over 200,000 seedlings and transplants. Conifers are preferred for planting on reserves, and to secure seed for this purpose the rangers, last summer, collected over 100 bushels of cones.

But although the development of field forestry has been rapid, other branches of the work have not been neglected. The administrative and office staff at the Branch headquarters in Ottawa now numbers forty, of whom eight are technically trained foresters. These latter are engaged in administrative work, in the accumulating of statistics concerning the lumber and allied industries, in the draughting of forest maps from field reports, and in the preparation and editing of Branch Bulletins, circulars and newspaper articles designed to stimulate public interest in practical forestry. The head office library now contains 1,300 books on Forestry and allied subjects, and in America is second only to the library of the United States Forest Service. Forty-five periodicals are subscribed for, not including forestry publications received in exchange from all over the globe. There are also 5,000 good negatives now on file in the library, which are available to public speakers and journalists for illustration of lectures, or press articles on forestry topics. Statistical information for similar use is also furnished free. Not the least important branch of head-office work is the keeping of a cost record of improvement work. This, in the words of Mr. Dwight, who is in charge of the Administration Office, 'is now a valuable source of information in regard to the expenditures of money and rangers' services, and the progress of the actual work on the various projects under construction.' This is sound business tactics, which many disparagers of forestry practice would do well to emulate.

The scientific side of forestry is also being developed at the Forest Products Laboratories recently established by the Forestry Branch at McGill University. Mr. A. G. McIntyre, the Superintendent, has already found employment for two assistants in the work of investigating the physical properties and possible new uses of Canadian woods. The results obtained will be extremely valuable to pulp and paper manufacturers, and to contractors and builders who seek cheaper native substitutes for expensive imported woods.

The tendency is for government forestry to become more and more self-supporting as time progresses. It has long been so in British India, where forestry practice is highly developed; it is rapidly becoming so in the United States in spite of an annual expenditure of over 4½ million dollars for forestry purposes, it will soon be so in Canada in spite of the fact that the revenue from Dominion Forest Reserves for the fiscal year ending March 31, 1913, barely exceeded $23,000, derived principally from the disposal of small amounts of timber to settlers and miners. But since the passage, in 1913, of the new Forest Reserve Regulations, permitting the grazing of stock to the full capacity of these reserves, a very important new source of revenue has been provided. The revenue from grazing on the National Forests of the United States last year amounted to over one million dollars. On Dominion Forest Reserves four million cattle, at the minimum charge of twenty-five cents a head, would produce a similar annual revenue, and the forest reserves should ultimately provide range for the number.

The present revenue from Dominion timber lands under licence now approximates one-half million dollars, but although a considerable portion of these timber limits are within forest reserves, the revenue is at present handled by another branch of the Department of the Interior.

Other natural resources are exhaustible; the forests can be rendered permanently productive; other resources are valuable for themselves alone; on the maintenance of the forests depends the perpetuation of Canadian game, and also all industries relying for their existence on a continuous water supply, which the forests alone can adequately regulate.

G. E. B.

Authorities agree that at least 60 per cent. of the tree as it stands in the forest is wasted in converting it into lumber, and that 25 per cent. of the trees remain in the forests to rot or be destroyed in forest fires.

With the Forest Engineers.

(Contributed by the Canadian Society of Forest Engineers.)

The Secretary announces the election of the following new members:—

Active.—Whiting Alden, E. H. Finlayson, S. S. Sadler.

Associate.—L. R. Andrews, F. G. Edgar, R. M. Brown, M. A. Grainger, R. G. Lewis, B. R. Morton, J. W. Ottestad, W. L. Scandrett, L. C. Tilt, C. McFayden.

Ottawa Forestry Club.

At a meeting held at the offices of the Forestry Branch on January 21st, the forest engineers of Ottawa formally organized the Ottawa Forestry Club, and elected the following officers:—

President, R. H. Campbell.

Vice-president, Clyde Leavitt.

Sec.-Treas., R. G. Lewis.

The Club is intended to bring the members into closer and better acquaintance with one another, and to aid in the study and discussion of forestry problems. The exact nature of its relation to the Canadian Society of Forest Engineers has not been formally settled, but it will be considered by the members as practically a branch of the Society.

The membership is not to be confined to professional foresters, but a class of members, for whom the name of 'local associates' has been suggested, will be admitted, consisting of those who, though without the regular forestry training, have some direct interest in forestry questions. The office of president of the Club, however, is restricted to members of the Canadian Society of Forest Engineers. Local associates, however, have all the other privileges of the Club, except that of voting on business directly concerning the C. S. F. E.

Meetings will be held at least once a month, from October to April (inclusive), and otherwise as determined on by the committee of management (i.e, the officers of the Club). The meetings will frequently take the form made so familiar by the Canadian Club gatherings, viz., a luncheon followed by a speech, or paper, or the discussion of some topic stated beforehand.

The finances will be managed by an assessment system.

Owing to the crowded state of the *Canadian Forestry Journal's* columns this month, a number of items have had to be held over till the February issue.

THE SPREADING OF THE BLUFFS.

By John Leggat, Forester, Man.

As the writer has lived for a number of years among the bluffs of Northwestern Manitoba, it might be interesting to your readers on the great treeless prairies to hear something of how Nature strives to reforest these districts when prairie fires are held under control. Northwestern Manitoba comprises the Riding Mountains and the country which lies between the mountains and the Assiniboine river to the south. The mountains are low hills of about two or three hundred feet in height and covered with spruce and poplar with numerous small lakes and hay swamps in the valleys. The Little Saskatchewan, Bird Tail and Shell Rivers, which are tributaries of the Assiniboine, take their rise in the mountains and flow southward. This tract of country between the mountains and the Assiniboine river is now all dotted over with poplar bluffs or groves, many of which have grown up since these lands were homesteaded and prairie fires held under better control; especially is this so of the odd numbered sections which were vacant for a number of years.

The reason why we find the poplar and willow spreading over the prairie is that the seed-bud comes on the tree in May, a little ahead of the leaf, and by the end of the month, when the leaf is formed, the seed-bulbs burst, and the little seeds which are imbedded among the woolly down contained in the seedbuds are carried across the prairie with the breeze like the thistle. In this natural way many districts of the prairie have become reforested and partly wooded. Along the main line of the C.P.R., between Medicine Hat and Calgary, young poplars were observed which had taken root in the moist soil of the railway ditches, the seeds of which would probably be carried from the bush along the banks of the Bow River a few miles to the south.

When we find that nature has provided the seeds of the poplar to spread over the prairie like the thistle, it must be in harmony with Nature for the farmer to reforest these fertile prairies, which no doubt have been denuded of trees and tree growth prevented by the prairie fires which must have swept the country before the advent of the settlers. The fact of coal underlying much of these prairies is an indication, we believe, that the country was at one time

wooded; and the farmer who cultivates a few acres of trees in the form of wind-breaks and shelter belts will be in harmony with nature and enhance the picturesque beauty of the landscape, the value of which will increase with age. In Northwestern Manitoba since these bluffs increased and grew up there have been no dry seasons to amount to anything, the fields are sheltered and the influence of a hot wind, blizzard or dust storm is nothing compared with what these are on the treeless prairies.

The experimental farm at Indian Head is an object lesson for the farmers of the great prairies to copy, and now that mixed farming is preferred, everyone knows the benefit of shade and shelter for stock, and as such a valuable heritage has passed into the hands of the people, without conditions of tree planting, and as there is no clearing to do, the farmer should be more anxious to take advantage of the free distribution of trees by the government and improve the beauty and increase the value of the surroundings. The C. P. R. is also giving valuable prizes for best wind-breaks and shelter belts for lands purchased from the company, and providing one half of the trees free of cost. These wind-breaks and shelter belts might be referred to as representing the wisdom and genius of the great prairies.

WHY PLANT A TREE?

Why plant a tree? Because the birds
That 'trance the listening air,
May nest among the rippling leaves
And sing your praises there.

Why plant a tree? Because the beasts,
As seasons come and go.
May shelter underneath the boughs
And there mute thanks bestow.

Why plant a tree? Because you may,
As aging years invade,
Eat of its fruit, admire its form,
Or rest beneath its shade.

Why plant a tree? Because your son,
And his son's son again,
For this alone in future years
May rise and bless your name.

OTTAWA RIVER CONSERVATION.

This is the first fall that the two conservation dams of the Upper Ottawa have been working to their full capacity and consequently there will be a great deal of interest particularly among power owners concerning the effect these dams will have on the volume of water available at the Chaudiere. So far it would seem that these dams are very effective in holding back the water for the low water seasons. This has been a very dry season and consequently the amount of water coming down to the Chaudiere would be expected to be very much reduced. However, it has held up remarkably well. At the very low water period a few years ago there were only 7,000 cubic feet of water per second flowing at the Chaudiere, while now the flow is about 24,000 cubic feet, or over three times as much. The two dams, at Kippewa and at Timiskaming, are both in operation this year. They hold back the water in the wet seasons and let it out in the dry seasons in order to keep the level of the river more nearly uniform all year. Then they begin about November to store up water again from the fall rains and let it out during the winter. The Government is now building a third dam at Lake Quinze, which is farther up and will increase the storage capacity considerably. To give an idea of the vast amount of water these dams conserve, it is equal to a body of water with an area of 4,000 square miles and a depth of one foot. Besides making the water higher in the low water periods it will to a certain extent relieve the floods of the spring by holding back the water. The work has been conducted by the Dominion Government and will cost about $1,000,000.—*Canadian Engineer.*

TREE SEED NOTES.

The crop of seeds harvested this season will be about the same as in past years. Some kinds of trees are again producing a good crop of seeds, while others are a failure.

The *Acer saccharinum,* sugar maple, has not produced any seed whatever this year, the entire crop having been blasted before maturing. *Larix Americana* is also a failure. A good crop of cones set last spring but the collectors found upon gathering them that the contents were of poor quality. The seeds did not test over five per cent. of good germinating quality.

Abies balsamea seed is also a total failure, none of the collectors being able to obtain a single pound of this seed.

American collectors report an abundance of 1913 crop of *Pinus strobus,* white pine, and they state that it is of the highest germinating quality. Here is a chance for nurserymen and foresters to replenish their stock of this fine lumber tree. Collectors also report a good crop of *Pseudotsuga Douglassi,* green variety, and state that the quality is very fine. *Pinus Banksiana* is also producing a good crop. *Pinus Palustris* is now being extracted from the cones and there seems to be a good supply.—*National Nurseryman.*

CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association is the organization in Canada for the propagation of the principles of forest conservation. This it does by means of conventions, meetings, lectures and literature.

It is a popular organization supported by the fees of members, assisted by some government grants.

There is a vast field of work before the Association which is only limited by the funds at the disposal of the Association.

Those who are not already members are invited to join and assist in the work. The membership fee is one dollar per year, and this entitles the member to attend and vote at all meetings and to receive the Annual Report and the *Canadian Forestry Journal.* Women as well as men are eligible for membership.

Applications for membership and requests for literature and information may be addressed to

The Secretary,
Caandian Forestry Association,
Canadian Building, Ottawa, Can.

OBJECTS OF THE ASSOCIATION.

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains and on streets and highways.

(5) Reforestation where advisable.

(6) The collection and dissemination of information bearing on the forestry problem in general.

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Candidates for advanced standing may take examinations in any subject but are required in addition to present evidence of a specified amount of work done in the field or laboratory.

The school year begins in early July and is conducted at the school camp at MILFORD, Pennsylvania.

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CANADIAN FORESTRY ASSOCIATION.

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Treasurer, MR. M. ROTHSAY, Journal Building.
Secretary, JAMES LAWLOR, Ottawa, Can.

(For full list of officers see page 21.)

CHANGE OF ADDRESS.

The office of the Canadian Forestry Association is now in the Journal Building, Ottawa, and to this address all communications should be sent. Mail which has been addressed to the old office will, however, reach us safely.

Be sure to make arrangements to take in the Halifax Convention, Sept. 2, 3 and 4.

HO! FOR HALIFAX.

It has been decided that the 1914 Forestry Convention is to be held in the fine old city of Halifax, and the date definitely decided upon is Wednesday, Thursday and Friday, September 2, 3 and 4.

The friends of the forest in Nova Scotia have been urging the claims of Halifax for six or seven years, and members of the Canadian Forestry Association in other provinces have backed up the effort, but until now the claims of Central and Western Canada proved too strong.

This time, however, the Government of the province and the lumbermen united in a strong invitation, and, at the annual meeting, this invitation was accepted, and Mr. F. C. Whitman, of Annapolis Royal, N.S., who has for many years, both as a director of the Association and as a lumberman, worked for forest conservation, was elected Vice-President. Mr. William Power, M.P., of Quebec, the new President, also believes that it is now the turn of Nova Scotia for a meeting.

The date first suggested was in the month of August, but after carefully considering all the factors involved, and consulting with those on the spot, it was decided that the best time was Sept. 2, 3 and 4, and these days have been fixed upon.

There has never been a convention more generally accepted than this one, and everything points to one of the most successful and useful conventions in the history of the Association.

Halifax, with its many attractions, historic, scenic and commercial, is one of the great convention cities of Canada, and many hundreds of Canadians from the central and western

parts of the Dominion now annually go down to the Land of Evangeline to take their recreation period in the beautiful country by the sea. Fuller details of programme, railway rates, etc., will be given in the next issue of *The Canadian Forestry Journal*, and all members who can possibly do so should make a point of taking in the convention, helping on the good work of forest conservation, and seeing the Maritime Provinces at the best season of the year.

THE PUBLIC AWAKENING.

When the *Canadian Forestry Journal* was started in 1905 there was practically no *news* about forest conservation. The editors wrote articles and secured articles from others on the subject, but there was scarcely anything to record in the way of action in regard to forests. Today there is hardly a week when there is not a meeting of some organization directly or indirectly connected with the subject. The meetings of the Canadian Lumbermen's Association and the St. Maurice Valley Forest Protective Association are noted in this issue. People are approaching forest protection from a dozen different points. The fact that at least fifty per cent. of Canada's area is absolute forest land, unsuited for ordinary forms of agriculture, is becoming known, and all classes of the community are beginning to awake to the need for developing this great source of revenue and power and fertility and health to the highest point. It is a time for the friends of forest conservation to rejoice and to put in their best strokes to further the cause.

THE ANNUAL MEETING.

Most of this issue is taken up with the report of the annual business meeting. The interview with the Prime Minister and the Minister of the Interior was an important event, and the whole meeting contains much important information. The Directors' Report summarizes the work of the year, and the revision of the Constitution was necessary in order that the association may cope with its growing work.

LONG ESTABLISHED LUMBER FIRM.

The announcement, in the *Canada Lumberman* of November 1st, of the incorporation of the firm of W. & J. Sharples, Quebec, P.Q., referred to provisions which were made by Mr. Wm. Power to continue the firm under its old name. Readers of the *Canada Lumberman* will recall that Mr. Power's two partners, Hon. John Sharples and Mr. R. Harcourt Smith passed away during the present year, leaving Mr. Power the sole surviving member of this old established firm. The firm was established in 1816 and Mr. Power has been connected with it for over a half a century.—*Canada Lumberman.*

POLITICAL PATRONAGE.

Instances of the nefarious operation of the patronage system could be cited and the cases multiplied. Executive officers get less than the subordinates. In one case an executive officer desires to report one of his staff who has gone off his head, but cannot do his duty for fear of "the heelers coming on his neck." A cashier getting $500 below the usual pay for such officers cannot get recognition without a heeler's recommendation, which he cannot do without losing his dignity or sacrificing his honesty.—Ottawa *Civilian.*

NEW DOMINION FOREST NURSERY.

A recent news note from Saskatoon says: Splendid progress has been made this season on the new Dominion Forestry Farm, a few miles to the north of this city. The area of the farm is 320 acres, 160 acres of which are now ready for seeding. The necessary buildings are well advanced, while a large amount of planting has already been accomplished. The land is laid out very artistically, and ere very long will be one of the beauty spots of the district, in addition to providing a source of supply for all manner of suitable trees and shrubs which are in such demand.—*Nor West Farmer.*

Fifteenth Annual Meeting

February 4, 1914.

The fifteenth annual meeting of the Canadian Forestry Association was held in the Banqueting Room of the Chateau Laurier on Wednesday, Feb. 4, 1914, the President, Hon. W. A. Charlton, in the Chair, and a good number of members in attendance. On motion of Mr. Goodeve, seconded by Mr. Denis Murphy, the minutes were taken as read.

The President nominated the following as members of the Nominating Committee: Senator Bostock (Convener), and Messrs. Goodeve, Ussher, J. B. Miller, R. H. Campbell, Gordon Edwards, and J. B. White. On motion of Mr. Hiram Robinson, seconded by Mr. Denis Murphy, these gentlemen were elected by the meeting.

Resolutions Affecting Federal Government.

The resolutions to be presented to the Prime Minister and Minister of the Interior were then taken up.

On motion of Senator Bostock, seconded by Mr. Ellwood Wilson, it was resolved that resolutions 2 to 9, as passed at the Winnipeg Convention, with a slight change in clause 5, be among those presented to the Government. These were as follows:

(2) Resolved, that this Convention approves the action of the Dominion Government in extending the areas included in Forest Reserves on watersheds and non-agricultural lands, and would urge on the Governments of the Dominion and of the Provinces the necessity for continuing the extension of such reservations until all lands of that character are included.

(3) Resolved, that before any lands bearing timber or lands contiguous to timbered areas are opened for settlement an examination of such lands should be made to determine whether they are best suited to the growth of timber or whether their opening would endanger the timber.

(4) Resolved, that this Convention would urge upon the Dominion Government the necessity for the afforestation of the sand lands throughout the prairies and the setting apart of such lands for this purpose.

(5) Resolved, that the Fire Ranging Service should be extended and made more efficient and that the rangers should be selected on the basis of their special qualifications for the work.

(6) Resolved, that the Canadian Forestry Association express its approval of the energetic policy which is being followed by the Dominion Commission of Conservation in investigating the important forest problems of Canada.

(7) Resolved, that the Canadian Forestry Association express its appreciation of the effective manner in which the Dominion Board of Railway Commissioners and the officers of the leading Canadian railway companies have worked together for the prevention and control of forest fires arising from operating railroad lines.

(8) Resolved, that this Convention again records its approval of the work of the Tree Planting Division of the Dominion Forestry Branch, not only in the free distribution of trees to settlers and the supervision of their growth, but also in thereby providing practical demonstrations to settlers in all parts of the country of the possibility of forest growth on the prairies.

(9) Resolved, that this Convention recommend that experiments be carried out by the Dominion and Provincial Governments affected to obtain data regarding the best methods of disposal of debris resulting from lumbering operations.

The other resolutions adopted for presentation to the Cabinet Ministers were as follow:

Moved by Col. Harkom, seconded by Mr. J. B. White, and

Resolved, that this Association again expresses the opinion that it is important that all appointments in the forest service of the Dominion and Provincial Governments should be based on capability and experience.

Moved by Mr. Chown, seconded by Mr. Goodeve:

Whereas, the Canadian Forestry Association, for several years past, has urged upon the Government of Canada the necessity for the establishment of a wood products laboratory, in order that the qualities and possibilities of our Canadian woods for structural, pulp, chemical and other purposes might be better understood, so that our forest products might be handled to the best advantage, and

Whereas, the Government of Canada has, in the past year, begun the establishment of a wood products laboratory at McGill University, under the Dominion Forestry Branch, therefore

Resolved, that this Association desires to place on record its appreciation of the action of the Government of Canada, and especially of the Minister of the Interior, in establishing this laboratory, and pledges itself to do what in it lies to rendering the work of the laboratory as useful and wide-reaching as possible.

Moved by Mr. J. A. Lefebvre, seconded by Mr. Hiram Robinson, and

Resolved, that this meeting recommends that the serious attention of the Government be drawn to the decrease of the maple sugar industry, and to the denudation of large areas formerly covered by the maple tree following the effect on the maple sugar industry of the adulteration and imitation of maple tree products, which can only be obviated by restricting the use of the word "maple" to pure products of the maple tree.

Interview With Government.

At 12.15 most of those present proceeded to the office of the Prime Minister, in the East Block, where they were received by Rt. Hon. R. L. Borden and Hon. W. J. Roche, Minister of the Interior.

The President stated the objects of the deputation, and briefly reveiwed the points of the different resolutions presented, the same being handed to the ministers in writing.

He was followed by Hon. Clifford Sifton, Chairman of the Commission of Conservation, who was present by request, and who spoke at considerable length on three subjects, namely: 1. The necessity of preventing settlement on lands unsuited for farming. 2. The lack of a scientific policy on Dominion timber berths, and 3. The need of a trained forest service under Civil Service regulations. He briefly illustrated each of these points. In regard to the second, he pointed out that the Branch of the Department of the Interior, which sold the timber, had no scientific foresters in it, and nad no officers to see that the regulations as to cutting, disposal of slash, etc., were carried out. On the other hand, the branch which had the trained officers and field staff was not charged with the care of the timber on the licensed timber berths. In connection with the third point he held that both the Dominion and the provinces needed a trained staff, and also needed to have the appointments to the same made in a way that would insure that good men would get the positions, and that promotions would be upon merit. He gave instances where men appointed by the ordinary political methods could not travel a quarter of a mile into the forest without being lost, and of search parties being sent out to find forest rangers. He urged that the service should be classified and put under a Civil Service Commission. He promised that if that were done that within five years such an advance would be made in forest conservation that it would astonish them all.

He pointed out that Canada was progressing in regard to trained men, for whereas in 1899 he was informed there was not one trained forester in Canada, there was now as head of Toronto University Forest School Dr. Fernow, the greatest forester in America, and this and other schools were turning out trained men.

Hon. Mr. Sifton concluded by reading a letter written in 1871 by Sir John Macdonald, then Premier of Canada, to Hon. John Sandfield Macdonald, then Premier of Ontario, in which he said that the sight of huge timber rafts continually passing under his window made him anxious that something be done to protect the forests, and he was constrained to wonder what would become of the Ottawa Valley after all the timber was gone.

Mr. Geo. Y. Chown pressed the necessity for employing trained foresters. He reminded the Prime Minister that in 1912 a deputation from the Association had pressed for the extension of Civil Service regulations to the outside service. The Prime Minister had said at that time that he thought some action would shortly be taken, and the deputation was again appearing to urge that that be done.

Hon. Mr. Borden, in replying, said he appreciated the importance of the matters which had been emphasized. So far as a trained forest service was concerned, it was not only desirable, but necessary. In the pressure of Parliamentary matters, the subject had escaped his attention, and possibly the same was also true of the Minister of the Interior, but he was prepared to take this matter up with him as soon as possible. He had been thinking about the subject of a Forestry Congress, of which Sir Wilfrid Laurier had spoken to him, and he wished to know if the deputation were prepared to express any views on this matter.

Hon. Mr. Charlton said that, speaking offhand, he could only say that the Canadian Forestry Association would be immensely pleased if the Government would call such a national gathering.

The Prime Minister, on being informed that the annual meeting was still in session, asked them to consider this question before they concluded, and to give him their views on this whole subject.

The deputation then withdrew.

Afternoon Session.

The meeting reassembled at 2.30, Hon. Mr. Charlton again in the chair.

The report of the Treasurer, Miss M. Robinson, for the year 1913, was presented by the Secretary as follows:

Receipts.

Balance from 1912	$2,234.37
Membership fees	2,466.00
Copies of *Journal*	30.46
Advertising in *Journal*	97.13
Refunds	19.00
Grant from Dominion Government	2,000.00
Grant from Ontario Government.	300.00
Grant from Quebec Government.	400.00
Grant from B. C. Government..	200.00

Grant from N. B. Government	[illegible]
Interest	[illegible]
Total	$7,906.11

Expenditure.

Salaries	[illegible]
Forestry Journal	[illegible]
Printing and supplies	[illegible]
Annual reports (two)	[illegible]
Winnipeg Convention	1,444.05
Telegrams and telephone	[illegible]
Letters, slides	[illegible]
Expenses of Secretary	197.08
Commission on cheques	12.03
Postage	177.00
Rent of chairs, Victoria Convention	31.25
Refund of fees	1.00
Subscription to monuments	50.00
Advertising re Victoria Convention	2.00
Cabinet for card index	8.00
Balance	925.19
	$7,906.11

Audited and found correct and in accordance with the books and vouchers of the Canadian Forestry Association. (Sgd.) Frank Hawkins, T. E. Clendinnen, auditors.

Ottawa, Jan. 13, 1914.

On motion of Col. Harkom, seconded by Senator Bostock, the report of the Treasurer was received and adopted.

Mr. R. H. Campbell presented the report of the Committee on the Revision of the Constitution, which was considered clause by clause, and finally adopted as printed on another page.

Forestry Congress Urged.

After discussing at considerable length the matter of a Forestry Congress, as requested by the Prime Minister, it was moved by Mr. Chown, seconded by Mr. Piché, and

Resolved, that in response to the question of the Rt. Hon. R. L. Borden, P. C., this Association would suggest that the Prime Minister do call a Dominion Forestry Congress, to be held at some convenient time, possibly when Parliament was in session, say January or February, 1915.

On motion of Mr. Goodeve and Mr. J. B. Miller, it was further,

Resolved, that Messrs. R. H. Campbell, Leavitt, Piché, Zavitz, Goodeve, the Secretary and the Ottawa Directors be a committee, with power to all to their number, to prepare an outline of what they deem desirable in the programme, and to submit the same to the Prime Minister, and that the Secretary inform the Prime Minister of the action taken by the Association, and that a report is being prepared.

Next Convention in Halifax.

Moved by Mr. Denis Murphy, seconded by Senator Bostock, and

Resolved, that the invitation of the Government of Nova Scotia and the lumbermen of [illegible] to hold the annual forestry convention in Halifax in August, [illegible] be accepted, the date to be fixed upon consultation with those issuing the invitation.

Senator Bostock presented the report of the Nominating Committee, and moved its adoption. As the Constitution had been amended to permit of the election of honorary officers at the annual meeting, all the officers of the Association were then elected as follows:

Patron—H. R. H. the Governor General.

Honorary President—Rt. Hon. R. L. Borden.

Honorary Past President—Rt. Hon. Sir Wilfrid Laurier.

President—Wm. Power, Esq., M.P.

Vice-President—Mr. F. C. Whitman, Annapolis Royal, N.S.

Treasurer—Mr. [illegible]

Territorial Vice-Presidents.

Ontario—Hon. W. H. Hearst.

Quebec—Hon. Jules Allard.

New Brunswick—Hon. J. K. Flemming.

Nova Scotia—Hon. O. T. Daniels.

Manitoba—Sir R. P. Roblin.

Prince Edward Island—Hon. J. A. Matheson.

Saskatchewan—His Honor G. W. Brown.

Alberta—Hon. A. L. Sifton.

British Columbia—Hon. W. R. Ross.

Yukon—Hon. Geo. Black, Commissioner.

Mackenzie—F. D. Wilson.

Patricia—His Honor Sir Douglas Cameron.

Ungava—His Grace Mgr. Bruchesi, Archbishop of Montreal.

Directors.

Re-elected—William Little, Hiram Robinson, Aubrey White, E. Stewart, W. B. Snowball, Hon. Sydney Fisher, R. H. Campbell, J. B. Miller, Gordon C. Edwards, Dr. B. E. Fernow, Ellwood Wilson, Senator Bostock, G. C. Piché, Alex. MacLaurin, A. P. Stevenson, Wm. Pearce, C. E. E. Ussher, Denis Murphy, C. Jackson Booth, Wm. Price, J. W. Harkom, A. S. Goodeve, W. C. J. Hall, J. S. Dennis, J. B. White, E. J. Zavitz, Geo. Chahoon Jr., R. D. Prettie.

Newly Elected—Hon. W. J. Roche, Minister of the Interior, Ottawa; Hon. Geo. H. Perley, Ottawa; A. C. Flumerfelt, Esq., Victoria, B.C.; Hon. N. Curry, Senator; Rt. Rev. Mgr. Roy, Bishop Auxiliary, Quebec; Mr. H. R. MacMillan, Chief Forester of British Columbia; Mr. Clyde Leavitt, Forester Commission of Conservation, Ottawa.

Ex-Officio—Thos. Southworth, Hon. W. C. Edwards, Geo. Y. Chown, John Hendry, Hon. W. A. Charlton.

After the election of officers it was moved by Mr. Miller, seconded by Mr. Goodeve, and

Resolved, that in the absence of the newly-elected President and Vice-President, Hon. W. A. Charlton do remain in the chair until the completion of the meeting.

On motion of Mr. Wm. Stanley, of Vancouver, seconded by Mr. Goodeve, the Directors' report, which had been presented to the meeting by the Chairman, was adopted, as given on another page.

Mr. Ellwood Wilson presented the report of the Committee on Formation of Local Associations, which showed there was considerable interest in this subject, and that it seemed likely a satisfactory plan could be worked out.

On motion of Mr. Wilson, the report was adopted.

Moved by Mr. Campbell, seconded by Mr. Leavitt, and

Resolved, that the Committee on the Formation of Local Associations be continued, and asked to pursue their work and to report again.

Moved by Hon. Hewitt Bostock, seconded by Mr. Goodeve, and

Resolved, that the thanks of this Association be communicated to His Royal Highness the Governor General for his kindness in continuing as Patron, and that the Secretary be instructed to convey to him the most respectful congratulations of the members upon the restoration to health of Her Royal Highness the Duchess of Connaught.

Moved by Mr. Miller, seconded by Senator Bostock, and

Resolved, that the thanks of the members of this Association be tendered to the Governments which have assisted this Association by grants in aid of its work, and to those chartered banks which have likewise helped by making a number of their branch managers members.

Moved by Mr. Piché, seconded by Mr. Zavitz, and

Resolved, that an honorarium of two hundred dollars be paid the Treasurer in recognition of her excellent services during the past year.

Moved by Mr. Leavitt, seconded by Mr. Wilson, and

Resolved, that Messrs. F. Hawkins and T. E. Clendinnen be paid ten dollars each for their services in auditing the books of the Association, and that they be appointed auditors for 1914.

Moved by Mr. Campbell, seconded by Mr. Wilson, and

Resolved, that in connection with the Halifax Convention, the Secretary be authorized to go to Halifax in advance and make arrangements for the same, including the expenditure of the necessary money.

Moved by Mr. William Stanley, seconded by Mr. J. E. Murphy, and

Resolved, that in no formal way, but with a desire to express gratitude for sympathetic help, this Association desires to express its appreciation of the assistance rendered the cause of forest conservation by the newspaper press of Canada.

Moved by Mr. Zavitz, seconded by Mr. Piché, and

Resolved, that the thanks of this Association be tendered the railways of Canada for the assistance rendered the Association in many ways during the past year.

Moved by Mr. H. C. Johnson, seconded by Mr. Campbell, and

Resolved, that the thanks of this Association be tendered the management of the Chateau Laurier for their kindness in placing this room at the disposal of the Association for holding its Annual Meeting.

Good Work of the Retiring President.

Moved by Mr. J. E. Murphy, seconded by Lt.-Col. Harkom, and

Resolved, that this Annual Meeting desires to place on record its appreciation of the time and thought devoted to the work of the Association in the past two years by the retiring President, Hon. W. A. Charlton, M.P. In 1912, when Vice-President, he attended the convention in Victoria, B.C., and assisted greatly in making that meeting a success. Last year he gave much time to the work of the Association in general, and to the Winnipeg Convention in particular. He left his sick room in Toronto to go to Winnipeg, and when there gave attention to every detail to make things run smoothly. When asked to open the Winnipeg Industrial Exhibition on the afternoon of the second day of the Convention, he consented only on being assured by the local committee that the publicity thus given would draw attention to the work of forest conservation. Mr. Charlton's long and varied experience and widespread interests in the timber business and public affairs, and his connections with movements for the betterment of the people of Canada have given added strength and prestige to the work of the Association.

The motion was put by Mr. Miller and carried by standing vote.

The President replied that he appreciated the resolution very highly. He had given considerable time to the work, especially in connection with the Winnipeg Convention, but it was a labor of love, a work he liked, and when the convention had proved successful he was well repaid.

(Concluded on page 30.)

Directors' Report for 1913.

To the Members of the Canadian Forestry Association:

Your Directors beg to report a year of steady effort and considerable progress in the work of the Association.

The chief feature of the year's work is always the Convention, and in 1913 this part of our propaganda was directed towards the problems of central Canada, the part lying between Lake Superior and the Rocky Mountains. The Convention was held in Winnipeg, and, in spite of many disadvantages as to season and lack of hotel accommodation, was most successful. It was opened by the Lieutenant Governor, Sir Douglas Cameron, and it was attended by leaders in commercial, banking and farming circles in addition to those whose presence is naturally expected,—those directly connected with forest industries. The large number of forest administrators and forest engineers present showed how rapidly this work is advancing in Canada. Besides men from all parts of Canada there was a good number from the United States, namely from Oregon, Minnesota, Michigan, Illinois, New York and Pennsylvania. The exhibit of native Manitoba timber collected and arranged by the Dominion Forestry Branch created great interest, and the size of the logs was a source of amazement to both visitors and Manitobans. The exhibit of injurious insects by the Dominion Division of Entomology was also very carefully studied.

It is not putting it too strongly to say that among the results of this Convention are a realization on the part of many central Canadians of the value of the forests of the prairie provinces, and of the importance to the prairie dwellers as consumers, of forest conservation in the forest provinces; a better appreciation of the importance of maintaining and developing the prairie forest reserves as sources of both timber and water; and, lastly, a glimpse of the value and possibilities of tree planting on the prairies. Perhaps the most significant thing about this Convention was the fact that it was impossible to conclude it at the time set out in the program. An extra evening session had to be arranged, and in attendance and interest this almost equalled the opening session. The Government of the Province of Manitoba and the City Council of Winnipeg took charge of the entertainment of the Convention and the Industrial Bureau provided the Convention Hall.

preceding year, and the correspondence received indicates that the interest in this has been more widespread. The report of the Victoria Convention (September, 1912) was issued early in the year. Then in pursuance of a new policy the report of the Winnipeg Convention held in July was issued early in the Autumn. This plan of issuing a report of a Convention while the gathering is still fresh in the minds of the people results in a more widespread circulation of the report. For no previous report has the demand been as great as for this one. The policy has been so satisfactory that it is proposed to continue it as far as possible. The issue of two reports, of five thousand copies each, accounts for the amount of $696 expended for this purpose.

The preparation of a comprehensive report in French containing the most salient points of the three latest Conventions was begun in the Autumn, but owing to the illness of the translator was not in the printer's hands at the end of the year.

The Canadian Forestry Journal is now issued monthly instead of bi-monthly, but owing to the reduction in size and the saving in postage it is costing practically the same as last year. It has proved that a monthly publication keeps interest alive better than one issued at less frequent intervals. The plan of publishing articles in French in the *Journal* has been discontinued, and, instead, by an arrangement with the Minister of Lands and Forests and the Minister of Agriculture of Quebec, suitable articles are published in the Journal d'Agriculture.

Bulletins to newspapers have been issued as in past years, but the service has not been increased, owing on the one hand to lack of time because of other work, and on the other to the excellence of the bulletin service of the Dominion Forestry Branch, which is now issuing an average of one bulletin a week. These bulletins are very widely used and cover the ground which the Association would naturally endeavor to cover.

During the Autumn the Secretary carried on a correspondence campaign for the extension of the membership, and the results were such as to warrant the increased use of this method in the future. The total amount received in members' fees in the year was $2,466, the largest in the history

of the Association. The number of new members who joined was 482, and of old members who died, resigned or lapsed, 269, leaving a net gain of 213 and a total membership of 3,034. As a number of these were in arrears for fees, and as the list is now closely checked, the number will be considerably reduced at the first revision in 1914. The number of life members was 158.

The Association had to mourn the loss of Mr. Herbert M. Price, of Quebec, a Director for several years, and President in 1908. Mr. Price always took the keenest interest in the work and has been greatly missed by the Directors. While Hon. John Sharples and Mr. R. Harcourt Smith, both also of Quebec, were not Directors, their high position in the lumbering world and the fact that both of them were partners of Mr. William Power, M.P., our Vice-President, caused their deaths to be felt as a distinct loss to the Association.

The Federal Government and the Governments of Ontario, Quebec, British Columbia and New Brunswick have continued their grants, while several of the banks and lumber companies have also subscribed for a number of their officers.

Looking over the general field it is seen that the work of forest protection and reforestry has made steady, if not rapid, gains in 1913. The amount appropriated by the Dominion Government for the work of the Dominion Forestry Branch was $541,000, and the work was carried on with an increased staff, particularly in the field, the number of men in the outside service being 360, of whom 25 were technically trained. The work of patrolling and trail and telephone building was more extensively carried on than ever before, and it is satisfactory to note that the fire loss was the smallest in the history of the Department, the amount burned over being only one-fiftieth of one per cent of the reserve area, of which only fifty acres was mature timber. Over ten thousand square miles have been added to the reserves in the prairie provinces and the Railway Belt in British Columbia. The area in the reserves in the different provinces is now: Manitoba, 4,108 square miles; Saskatchewan, 1,803 square miles; Alberta, 26,271 square miles; British Columbia, 3,782 square miles. Alberta has the first place because of the immense Rocky Mountains Forest Reserve covering the eastern slope from the International Boundary to the Peace River country.

The regulations permitting the grazing of stock on the forest reserves have been revised. This will increase the usefulness of the reserves and make them more popular with settlers, while at the same time the forest growth will not be impaired.

The work of tree planting on prairie farms is increasing. Last year over 3,500,000 trees were sent out to farmers from the Indian Head Nursery Station, and the Dominion Forest Branch has established a new nursery near Saskatoon to keep up with the demand.

For several years by resolution and deputation this Association pressed on the Dominion Government the need of establishing a forest products laboratory. Your Directors are now happy to state that this end has been attained, and that a laboratory under the Dominion Forestry Branch has been established in one of the buildings of McGill University, Montreal. This, it is believed, marks the starting of a most valuable aid to the highest utilization of our forests, and the enterprise of the Government and of the Minister of the Interior is to be commended.

In Ontario the Government spent on forest protection and development, according to figures given by Hon. W. H. Hearst, Minister of Lands, Forests and Mines, $234,000, and the limit holders $91,000, making a total of $325,000. This was spent chiefly in patrol work, 925 men being employed, 560 by the Government and 365 by the limit holders. The work of sending out trees to farmers and planting up sand lands in Norfolk county was enlarged.

The amount appropriated for forest administration in Quebec was $100,000 and $18,000 additional for the fire protective branch. It is estimated that the limit holders spent $150,000 for their share of protection. The St. Maurice Valley Protective Association carried through another successful year in protecting the seven million acres of forest in that district. Your Directors express the hope that this co-operative work will rapidly spread to other parts. The Province of Quebec has made a beginning in planting up sand lands and in distributing seedling trees to farmers. The policy of creating township forest reserves is being extended.

In British Columbia a survey of the forest lands is in progress. Lands desired for settlement must first be examined by the Forest Branch to ascertain if they are suited to agriculture. The timber lessees pay 1½ cents per acre and the Government adds a like amount to a fire protection fund. This amounted in 1913 to $375,000. With this, during the year 1913, 415 rangers were employed in addition to 60 employed by the railways. At the conclusion of the danger season the rangers were employed in cutting roads and fire lines and erecting telephone lines and lookout stations. In this way by the Autumn of 1913 1,205 miles of trail and 529 miles of telephone line had been constructed.

In New Brunswick about $35,000 was spent by the Government on forest fire pro-

licensees. The question of leases, all of which were timed to expire in 1918, was settled during the year by new leases running for twenty and thirty years with renewal privileges.

In Nova Scotia about $8,000 per annum is spent collectively through the municipalities by the timber licensees on protection, in addition to which the Province pays the salary of the Chief Fire Warden. Amounts spent by individuals and corporations in fighting fires on their limits this season have been much larger. A more complete organization is in contemplation by the Provincial Government.

Progress is noted in protection by private individuals and corporations throughout the Dominion. The locomotives on 587 miles of railway have been changed from coal-burners to oil-burners. These lines are in the Rocky Mountains and on Vancouver Island, and are as follows: Canadian Pacific Railway, 338; Esquimault and Nanaimo Railway, 134; Great Northern Railway, 115. The Grand Trunk Pacific Railway is also about to introduce oil-burners on its Rocky Mountain lines. The Canadian Northern Railway has established a department solely devoted to fire protection work, and expects to develop this in the coming year. All the railways have made provision by appointing special officers to carry out the orders of the Canadian Board of Railway Commissioners and to co-operate with the officers of that body and of the federal and provincial forest departments.

The lumber and pulp companies are cutting timber with less waste than ever before; a number of them are having their holdings surveyed and estimated by forest engineers, and some are beginning to experiment in thinning and replanting.

The use of [illegible] rapidly increasing, there being several large plants in Canada for the treatment of railway ties, which will check the rapidity of the increase of this drain on the forests.

The educational side is being well looked after by three forest schools located at Toronto, Quebec and Fredericton.

These schools will be able to supply the limited number of highly trained technical men, required as forest administrations grow, without overcrowding the profession. A development of lower grade schools, however, designed to educate forest rangers and woods superintendents is now most needed.

The greatest need, viewed from the standpoint of a propagandist organization like ours, is the increase of the body of public opinion informed on this question. With this secured, the hands of all forest administrators will be strengthened, the effort to secure the extension of civil service regulations to the outside service will be rendered easier, and all forest extractive industries will be placed on a more permanent basis. Though much remains to be done, still much has been accomplished since this Association was formed in the year 1900, and your Directors urge upon all members the making of greater efforts, both individual and as an Association, to further this patriotic work which means so much to every citizen of the Dominion.

Constitution and By-Laws.

As Revised at the 1914 Annual Meeting.

I. NAME.

The name of the Association shall be: The Canadian Forestry Association.

II. OBJECT.

Its objects shall be:—

(1) To advocate and encourage judicious methods in dealing with our forests and woodlands.

(2) To awaken public interest to the sad results attending the wholesale destruction of forests (as shown by the experience of older countries) in the deterioration of the climate, diminution of fertility, drying up of rivers and streams, etc., etc.

(3) To consider and recommend the exploration, as far as practicable, of our public domain and its division into agricultural, timber and mineral lands, with a view of directing immigration and the pursuits of our pioneers into channels best suited to advance their interests and the public welfare. With this accomplished, a portion of the unappropriated lands of the country could be permanently reserved for the growth of timber.

(4) To encourage afforestation wherever advisable, and to promote forest tree-planting, especially in the treeless areas of [illegible] lands where the proportion of woodland is too low, and upon highways and in the parks of our villages, towns and cities.

(5) To collect and disseminate, for the benefit of the public, reports and information bearing on the forestry problem in general, and especially with respect both to the wooded and prairie districts of Canada, and to teach the rising generation the value of the forest with a view of en-

listing their efforts in its preservation.

(6) To secure such forestry legislation from time to time from the federal and provincial governments as the general interests demand, and the particular needs of the people seem to require.

III. MEMBERSHIP.

Its membership shall include all who pay an annual fee of $1.00 or a life membership fee of $10.00.

IV. HONORARY OFFICERS AND TERRITORIAL VICE-PRESIDENTS.

The Honorary Officers shall consist of a Patron, Honorary President and Honorary Past President.

There shall be not more than fifteen Territorial Vice-Presidents, and the aim in selecting the same shall be to appoint a representative for each province and territorial division of Canada.

The above shall be appointed at the annual meeting of the Association, and they shall not be members of the Board of Directors.

V. OFFICERS.

The officers shall consist of a President, a Vice-President, a Secretary and a Treasurer.

VI. BOARD OF DIRECTORS.

The Board of Directors shall consist of the Officers and not more than thirty-five Directors, elected annually, and all Past Presidents of the Association, from and including the year 1909-10.

VII. NOMINATIONS AND ELECTIONS.

The President, Vice-President, Treasurer and Directors shall be elected at the annual meeting of the Association, and shall hold office for one year, and until their successors are elected. Nominations for Honorary Officers, President, Vice-President, Territorial Vice-Presidents and Treasurer and Directors shall be made by a Nominating Committee of not more than seven members who shall be elected by open vote on nomination of presiding officer or others at the first session of the annual meeting of the Association. The Nominating Committee's report may be adopted by open vote, or, if amendments to it are moved, the vote shall be by ballot.

VIII. EXECUTIVE COMMITTEE.

The officers and Board of Directors shall constitute an Executive Committee, and five of the same shall be a quorum.

IX. ANNUAL MEETING.

The annual meeting of the Association shall be held during the month of February in the City of Ottawa, unless otherwise determined by the Executive Committee of the Association and a notice of one month of the date selected shall be given to each member by the Secretary.

X. SPECIAL MEETINGS.

Special meetings shall be held at such times and places as the Executive may decide, a sufficient notice of which shall be sent to each member by the Secretary.

XI. AMENDMENTS.

Amendments of the Constitution can only be adopted by a two-thirds vote of the members present and entitled to vote, and at the annual meeting of the Association, and a notice of such intended amendment shall be given with the notice calling the meeting.

BY-LAWS.

President.

It shall be the duty of the President to preside at all meetings of the Association and of the Board of Directors. He shall be *ex-officio* a member of all standing committees.

Vice-President.

In the absence of the President, a Vice-President shall preside at all meetings of the Association; and in the absence of all of them a President *pro tempore* shall be elected by the meeting.

Secretary.

The Secretary shall be appointed whenever there is a vacancy in the office by the Board of Directors. He shall hold office during the pleasure of the Board of Directors unless otherwise ordered by two-thirds of the members present, and voting at an annual or special general meeting of the Association. It shall be the duty of the Secretary to keep the minutes of each meeting, have charge of the books and records and other documents belonging to the Association; conduct all correspondence connected with the affairs of the Association; notify members of the time and place of meeting; and to perform all duties prescribed for him by the Board of Directors. He shall not engage in any other business without the consent of the Board of Directors. He shall be the secretary of all standing committees. He shall be paid a salary to be determined from year to year by the Board of Directors.

Treasurer.

The Treasurer shall have the custody of all moneys received, and shall deposit or invest the same in such manner as the Board of Directors shall direct, and shall not expend money except under direc-

tion or approval of the Board of Directors or the Executive Committee.

Board of Directors.

It shall be the duty of the Board of Directors to manage the affairs of the Association, and the Board may appoint any necessary assistants required by the Officers. Any position among the Officers or Directors which may become vacant during the year may be filled by the Board of Directors.

Annual Audit.

At the annual meeting of the Association there shall be appointed two auditors, whose duty it shall be to examine and audit the books, accounts and records of the Association or of any officers, employees or committees thereof, and shall report to the annual meeting of the Association.

Financial Year.

The financial year of the Association shall close on December 31st of each year.

Conduct of Meetings.

(*a*) Parliamentary rules shall govern all meetings of this Association.

(*b*) All motions shall be made in writing.

(*c*) In the event of conflict of opinion, the Chairman shall decide all questions of order.

(*d*) Having once spoken to a motion a member must obtain permission from the Chair to be again heard regarding it. The Chair may at any time declare a subject open for general conversational discussion, and may in like manner determine same.

Order of Business.

At the regular meeting of the Association the order of business shall be that approved by the Board of Directors and announced by the Presiding Officer. In the absence of such prepared order of business, the following shall be observed:—

1. Reading of minutes of previous meeting.
2. Business arising out of minutes.
3. Receiving communications.
4. President's address.
5. Directors' report.
6. Treasurer's report.
7. Reports of Standing or Special Committees.
8. Unfinished business.
9. New business.
10. Notices of motion.
11. Election of Officers and Directors.

The order of business may be varied at any meeting by a majority vote of those present; or it may be suspended at the discretion of the Chair.

Lumbermen and Forestry

Successful Annual Meeting of the Canadian Lumbermen's Association

The sixth annual meeting of the Canadian Lumbermen's Association, held in the Chateau Laurier on February 3, was the most successful in the history of that organization. The chair at the business sessions was occupied by Mr. Alex. MacLaurin, of Montreal, the retiring President, who in his annual address noted the progress made in the year. The reports of the different committees showed greater activity in association work than in any previous year, and a larger list of members and wider field of operation. Matters of great importance to the lumber trade were dealt with, and among those who took a leading part in the discussions were Senator Edwards, Senator George Gordon, Sir Henry Egan, Lt.-Col. J. B. Miller and Mr. Denis Murphy. The reports of the Secretary, Mr. Frank Hawkins, were highly commended.

The following officers were elected: Hon. President, J. R. Booth; President, Hon. Geo. Gordon; Vice-Presidents, Sir Douglas Cameron, Lt.-Governor of Manitoba; Angus McLean; Hon. Treasurer, R. G. Cameron; Secretary, Frank Hawkins, Ottawa.

Directors: the above and E. A. Dunlop, M.L.A., E. R. Bremner, W. C. Laidlaw, P. C. Walker, Duncan McLaren, A. E. Craig, Gordon C. Edwards, J. G. Cane, W. J. Lovering, A. L. Mattes, A. H. Campbell, G. W. Grier, A. MacLaurin, W. G. Power, John Hendry, A. D. McRae, Wm. McNeill.

The annual banquet, held at the Chateau Laurier, witnessed a departure from previous functions of like character in that ladies were present. In fact this was an innovation for Ottawa. The experiment was [illegible] and the banquet was the best ever held by the Association. The chair was occupied by the newly elected President, Senator Gordon, and at the head table were Sir Wilfrid Laurier, Hon. George E. Foster, Minister of Trade and Com-

merce; Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario; Hon. W. A. Charlton, President of the Canadian Forestry Association; Senator Edwards and Mr. A. B. Cruikshank, of New York.

The speaking was of a very high order, Sir Wilfrid Laurier and Hon. Mr. Foster emphasizing the great importance of the forests to the country and the need of perpetuating forests on non-agricultural lands, while Hon. Mr. Hearst, besides showing what a large part of Ontario's revenue came from the forests, dwelt on the fact that, willing as governments and lumbermen were to conserve the forests, they must enlist the sympathy and support of the general public. Hon. Mr. Charlton showed that this latter was the reason for existence of the Canadian Forestry Association, and Mr. A. B. Cruikshank gave a most witty and telling address on the business and humanitarian side of the great lumber industry.

St. Maurice Forest Protective Association

Second Annual Meeting Shows Encouraging Progress.

The annual meeting of the St. Maurice Valley Forest Protective Association, held at the Place Viger Hotel, Montreal, on Feb. 24, showed a very gratifying state of progress by the Association. The chair was occupied by the retiring President, Mr. J. M. Dalton, of Three Rivers, and all the companies or individuals in the Association were present or represented.

The President's Report was most optimistic. It showed that in spite of the dry season the loss to timber from fire in the area controlled by the Association was less than 1/1000th of one per cent. of the value of the timber. The Association was steadily growing, 102,000 acres aving been added to its territory in 1913 and 266,000 acres more added up to Feb. 24, 1914. Further additions were expected, and the limit holders of the Rouge, Lievre and Gatineau Valleys were considering forming similar associations. Appreciation was expressed of the support given the Association by Hon. Jules Allard, Minister of Lands and Forests for Quebec, and Mr. W. C. J. Hall, Chief of the Forest Protection Branch. The excellent work done by the Manager of the Association, Mr. Henry Sorgius, was acknowledged. The fact that a dry season had been passed through with practically no loss was the best proof of the efficiency of the organization. The greatest need at present was the education of farmers and settlers, and to this end the suggestion was made that the co-operation of the Department of Education be asked to distribute literature in the schools and to send lecturers with lanterns to the smaller towns. The President advocated wider publicity work generally, through newspapers and otherwise.

The Manager and Secretary, Mr. Sorgius, presented the reports in detail covering the work of the year. The financial report showed total receipts of $23,779, all of which except $4,131 came from assessment on members. The remainder came from proportion of railway patrol and $2,300 grant from the Quebec Government.

The total number of fires extinguished was 306. These were started by the following agencies: settlers, 151; fishermen and sportsmen, 8; river drivers, 17; jobbers, 4; railroads, 17; unknown, 102, and one each by tramps, berry pickers, Indians, lightning, explorers, trappers and improvement gang.

The permanent improvements included eight lookout towers, ranging from 35 to 87 feet high, 200 miles of trails, and 15 miles of telephone line.

The officers elected were: President, Mr. S. L. de Carteret; Vice-President, Mr. Ellwood Wilson; Manager and Secretary-Treasurer, Mr. H. Sorgius; Directors, Messrs. J. M. Dalton, de Carteret, Wilson, C. Le Brun, R. F. Grant and F. L. Ritchie.

A resolution was passed for presentation to Premier Sir Lomer Gouin, expressing appreciation of the policy of fire protection extended under the administration of Hon. Mr. Allard and asking for further work in this direction. The resolution pointed out that the Provincial revenue from forests last year had been $1,760,466, with an expenditure of $327,383, while there had been appropriations of $18,000 for fire protection, $90,000 for forest service and inspection, and $5,000 for forestry education. They therefore asked that the amount voted for fire protection be increased to $50,000 at least.

In the evening the annual banquet at the Place Viger Hotel was a most successful affair. The toastmaster was Mr. Ellwood Wilson, and with him at the head table were Hon. Jules Allard, Mr. R. H. Campbell, Dominion Director of Forestry, Mr. Alex. MacLaurin, Mr. Carl Riordon, Mr. Clyde Leavitt, Mr. J. C. Sutherland, Inspector of Quebec Schools. Others in attendance, in addition to the officers, were Messrs. E. J. Graham, Buckingham; C. Le Brun, Shawinigan Falls; C. E. Read, Jr., St. Jovite; J. P. MacLaurin, Montreal; J. H. Dansereau, Three Rivers; J.

B. White, Montreal; W. C. J. Hall, Quebec; J. E. Rothery, Mount Laurier; Geo. DeLisle, M.P.P., W. H. Parker, W. J. MacGowan, F. M. Spaulding, and James Lawler, Secretary of the Canadian Forestry Association. The speeches were all of an encouraging nature, and a feature of the dinner was the display of a number of camera views showing conditions in the St. Maurice Valley.

This work is of such an encouraging nature that no excuse will be made for referring to other features of this meeting in future issues of the *Canadian Forestry Journal.*

With the Forest Engineers.

(Contributed by the Canadian Society of Forest Engineers.)

Annual Meeting, C. S. F. E.

The annual meeting of the Canadian Society of Forest Engineers for 1914 was held in Ottawa on February 4th, beginning at three o'clock p.m. In the absence of the President, Dr. B. E. Fernow, who was prevented by pressure of other duties from being present, the chair was occupied by the Vice-President, Mr. R. H. Campbell. Members in attendance were Messrs. D. R. Cameron, J. R. Dickson, T. W. Dwight, E. H. Finlayson, F. W. H. Jacombe, A. Knechtel, C. Leavitt, W. N. Millar, G. C. Piché, H. C. Wallin, Ellwood Wilson and E. J. Zavitz (active) and R. G. Lewis and B. R. Morton (associate).

The Secretary-Treasurer reported the total number of members now on the roll as fifty-nine—forty-four active, thirteen associate, and two honorary—and a substantial cash balance to the credit of the society.

Important changes were made in the Constitution, the one on Mr. Wilson's notice of motion, amending the qualifications for active membership, and the other, in accordance with the Executive Committee's report, making extensive alterations in the method of nomination and election of officers. The clause (Article III, Section 3) regarding the qualifications for active membership in the Society now reads as follows:—

'Active members shall consist of trained foresters, and the following named persons, in recognition of their eminent services in the interest of forestry previous to the advent of professional foresters, viz., E. Stewart, W. C. J. Hall, E. G. Joly de Lotbiniere, R. H. Campbell and Thos. Southworth. Active members shall be graduates of a forest school in good standing and shall have been in the practice or teaching of some branch of forestry for at least two years, or shall be men who, while not graduates of a forestry school, have been engaged in active forestry work for at least five years and have, in the opinion of the Executive Committee, achieved sufficient distinction to entitle them to active membership. The character and achievement of all such candidates must be approved by the Executive Committee. All names of candidates must be submitted to the Executive Committee for approval before being submitted to the Society. Only active members shall have the right of voting and holding office.'

The change in the method of election of officers consists in the appointment of a Nominating Committee, to be named by the President within four weeks of his election; this committee is to submit to the members, at the time of balloting, a list of three nominees for each office. The right of individual members to make nominations is not, however, done away with. Elections are to be decided on the proportional system.

The proposal to form 'District Executive Committees' was approved. These take the place of the Advisory Committees, and consist of three members for each district. The districts are (1) Quebec and the Maritime Provinces, (2) Ontario, (3) the Prairie Provinces, and (4) British Columbia, to be elected, at the time of the regular elections of officers, by the members resident in the district. These District Executive Committees are to take charge of all business pertaining exclusively to their respective districts, subject to an appeal to the Executive Committee of the Society. The chairman of the committee is to be designated on the ballot electing the members of the committee, and is to be a member of the Society's Executive Committee, which now consists of seven members.

The election of members by general vote of the active members of the Society is done away with. Hereafter the name of the nominee, together with his record, is to be submitted, first, to the District Executive of the district in which he is located. Their judgment, whether favorable or unfavourable, is to be sent to the Central Executive,

and, if six of the seven members of the committee approve the nomination, the candidate is to be admitted a member of the Society.

The committee on standardizing forest maps submitted a draft legend, which will be circulated to organizations making forest maps, with the request that it be followed in that work.

A committee of three (Messrs. Jacombe, Zavitz and Leavitt) was appointed to consolidate the Constitution of the Society.

Ottawa Foresters Dine.

The inaugural meeting of the Ottawa Forestery Club, the organization of which was noted in this column last month, was held on the evening of January 30th, and took the form of a dinner followed by short speeches. Members and guests to the number of twenty-one sat down, the head of the table being occupied by the President, Mr. R. H. Campbell, and the Vice-President, Mr. Clyde Leavitt, having the position at the other end of the board (said board being guaranteed genuine *Swietenia mahogani*). The guests of the evening were the District Inspectors of Forest Reserves, Messrs. W. N. Millar, of Calgary, Alta., F. K. Herchmer, of Winnipeg, Man., G. A. Gutches, of Prince Albert, Sask., and D. R. Cameron, of Kamloops, B.C., and the Superintendent of the newly established Woods Products Laboratories, Mr. A. G. McIntyre, of Montreal.

After dessert had been served and the cigars passed, the chairman called on each of the guests to give a short talk on the work being done in his own special department. This item finished, the guests spent a social hour, regaling each other with 'rabbit', 'porcupine' and other stories, after which the National Anthem brought a successful meeting loyally to a close. In addition to those previously named, the following were present: J. Lawler, Secretary Canadian Forestry Association, and T. W. Dwight, J. R. Dickson, J. A. Doucet, Geo. E. Bothwell, E. H. Finlayson, R. G. Lewis, B. R. Morton, G. S. Smith, H. C. Wallin, F. W. H. Jacombe, F. H. Byshe, C. J. Tulley and D. McCann, of the Forestry Branch.

B. C. Foresters Organizing.

Owing to the demands on the columns of the *Journal* in its last issue, reference to the organization of the foresters of British Columbia was omitted. Regarding this, Mr. H. R. MacMillan wrote, under date of January 31st:—

'I do not know if you have received a report of the meeting which was held in Vancouver on December 15th. A foresters' dinner was arranged and there were present about thirty foresters representing the Dominion Forest Service, Canadian Pacific Railway, Provincial Forest Service, and foresters engaged in private work in British Columbia. This, I think, is the largest gathering of graduate foresters which has yet been held in Canada. Dr. Wesbrook, President of the new British Columbia University, was at the dinner and gave a short address on his plans for development of a forest school in connection with the University. He assured the foresters assembled that such a school would be undertaken within two years.

'Arrangements were made at this time for the formation of the local society of foresters, and a committee consisting of R. D. Prettie, W. J. VanDusen, R. D. Craig, D. R. Cameron and myself were appointed to arrange for the organization. This committee has not yet held its first meeting, but it is planned to undertake the preliminary organization immediately along the line of the suggestions which have been made by yourself.'

FIFTEENTH ANNUAL MEETING.

FEBRUARY 4, 1914.

(Continued from Page 22.)

Moved by Mr. Stanley, seconded by Mr. Harkom, and

Resolved, that the minutes of the Directors' meetings be sent to the Directors and the Honorary Vice-Presidents.

Moved by Col. Harkom, seconded by Senator Bostock, and

Resolved, that the Secretary and Treasurer be thanked for their careful attention to the business of the Association during the year.

The meeting then adjourned.

THE VALUE OF FORESTS.

The State of Ohio was once covered by forests. Then there were no devasting floods. The forests were cut away, cut indiscriminately, ruthlessly, ignorantly. Now we have the tragedy of Dayton and other lesser ones every year. If a few square miles of carefully tended forests had been left at strategic points around the headwaters of the various rivers and streams of Ohio, the United States would not be mourning these hundreds of dead or regretting the millions of money. This is part of what is meant by conservation.—*Exchange.*

CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association is the organization in Canada for the propagation of the principles of forest conservation. This it does by means of conventions, meetings, lectures and literature.

It is a popular organization supported by the fees of members, assisted by some government grants.

There is a vast field of work before the Association which is only limited by the funds at the disposal of the Association.

Those who are not already members are invited to join and assist in the work. The membership fee is one dollar per year, and this entitles the member to attend and vote at all meetings and to receive the Annual Report and the *Canadian Forestry Journal.* Women as well as men are eligible for membership.

Applications for membership and requests for literature and information may be addressed to

The Secretary,
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Journal Building, Ottawa, Can.

OBJECTS OF THE ASSOCIATION.

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains and on streets and highways.

(5) Reforestation where advisable.

(6) The collection and dissemination of information bearing on the forestry problem in general.

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Candidates for advanced standing may take examinations in any subject but are required in addition to present evidence of a specified amount of work done in the field or laboratory.

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Halifax Convention.

We trust all our members will keep in mind the date fixed for the Halifax Convention, namely, September 1, 2, 3 and 4. This date, it is believed, best suits the needs of Nova Scotia, and, on the other hand, it is the ideal time for visiting the Maritime Provinces. The details are now being worked out, and will be given as soon as possible in future issues of the *Canadian Forestry Journal*. If any member desires to learn about any particular feature, if he will write to the Secretary, all the information available will be gladly given.

Directors' Meeting.

A meeting of the Directors was held in the office of the Director of Forestry, Journal Building, Ottawa, on March 10. In spite of the fact that it was held so soon after the annual meeting, there was an unusually good attendance of Directors. The chair was occupied by Mr. William Power, M.P., the new President, who had just returned from England. The chief object of the meeting was to settle definitely the date of the Halifax Convention, which had been left open by the Annual Meeting for consultation with the Government of Nova

Scotia, upon whose invitation the Convention is being held this year, and the lumbermen of that province. Mr. F. C. Whitman of Annapolis Royal, N.S., the Vice-President who is giving a great deal of time to this Convention, was present and explained what had been done to date. Mr. Whitman's efforts were much appreciated, and this appreciation was voiced by Hon. Mr. Charlton. After the question had been fully discussed, on motion of Senator Edwards, seconded by Mr. Denis Murphy, the date was fixed for September 2, 3 and 4, and other necessary matters settled. The attendance and spirit of this meeting augurs well for the success of the Halifax Convention.

In the Maritime Provinces.

As soon as possible after the Annual Meeting the Secretary went to Halifax, where he met Mr. F. C. Whitman, the Vice-President, and with him called upon Hon. O. T. Daniels, Attorney General and Commissioner of Crown Lands, and a number of leading citizens, and discussed the details of the Convention. These consultations were very satisfactory, and showed that there is a real desire on the part of a large section of the people of Nova Scotia for this Convention. It is fortunate that the best time of the year for the timber land owners to come to Halifax is also the most satisfactory time for people from Central and Western Canada to visit the Atlantic Coast. About half the timber of Nova Scotia is owned outright by farmers, whose holdings run from 200 acres to 1,000 acres in extent, probably averaging about 450 acres. Much of this has been cut over, and the owners are anxious to know how to handle these lands, in order to get the best results from their remaining forest, and to promote the young growth.

The lumbermen who own the other half, roughly speaking, of the timber in comparatively large blocks, are naturally keenly interested. They hold their lands generally in fee simple, and can therefore adopt at once any methods that appeal to them. That the Government is interested in this subject both as it relates to Crown lands, and to forest lands generally is shown by the fact that detailed reference to this subject was made in the speech from the throne at the opening of the Legislature, in February of this year.

On the return journey to Ottawa, the Secretary spent some time at St. John and Fredericton, N.B., and found that the interest in forest conservation, which the Fredericton Convention of 1910 helped to arouse, has by no means died away, but that forestry matters in New Brunswick are more forward than they have ever been before.

Tree Planting in Ontario.

On another page will be found the report of an address by Mr. E. J. Zavitz, Provincial Forester of Ontario, explaining what has been done in tree planting by farmers in the older part of the province. As yet, tree planting is a very small part of forest work in Canada, yet in its own sphere it is most important. Much of the land of southern Ontario is unfit for anything else but trees, and if this land is not growing trees it represents a sheer loss to the community. Besides this there is the relation of the forests on these lands to stream flow, and agriculture. As Mr. Zavitz explains, the idea grows slowly, but as some of the older plantations have been set out for five or six years and are beginning to make a showing, there is every reason to believe progress will be much faster from this time onward. Tree planting on the prairies under the direction of the Dominion Forestry Branch has reached large proportions, and while it is natural to expect slower progress in the wooded provinces of Ontario and Quebec, yet in a few years it is bound to grow to large proportions in these provinces also.

(Continued on Page 36.)

Wm. Power, Esq., M.P., President Canadian Forestry Association, 1914-15.

OUR PRESIDENT.

Mr. William Power, M.P., President of the Canadian Forestry Association, has been connected with forest industries all his life. Born at Sillery, a suburb of Quebec, he early entered the employ of the firm of W. and J. Sharples, lumbermen and timber exporters of Quebec. After that connection had lasted for over fifty years, during a good part of which he was a partner, he became, last year, the sole surviving partner, through the death, within a few weeks, of each other, of Hon. John Sharples and Mr. R. Harcourt Smith. This has thrown a great deal of additional work on Mr. Power, but the business is being carried on vigorously on the lines on which it has developed for nearly a century. Mr. Power's activities have not been confined to one line. In addition to other important business interests, he has filled the offices of president and director of the Quebec Board of Trade, school commissioner for Quebec city, director Canadian Lumbermen's Association, and was a member of the special committee for the Tercentenary Celebration of the founding of Quebec. He is the member of the Canadian House of Commons for Quebec West. In spite of these private and public duties, Mr. Power has found time to personally explore a large part of the northern timber country of Quebec, and few living men have been over more of that territory, or have a better knowledge of it. Mr. Power has been a member of the Canadian Forestry Association since its foundation and a director for five years, and there is no doubt he will maintain the high traditions of the office.

(Continued from Page 34.)

An Honour to Canada.

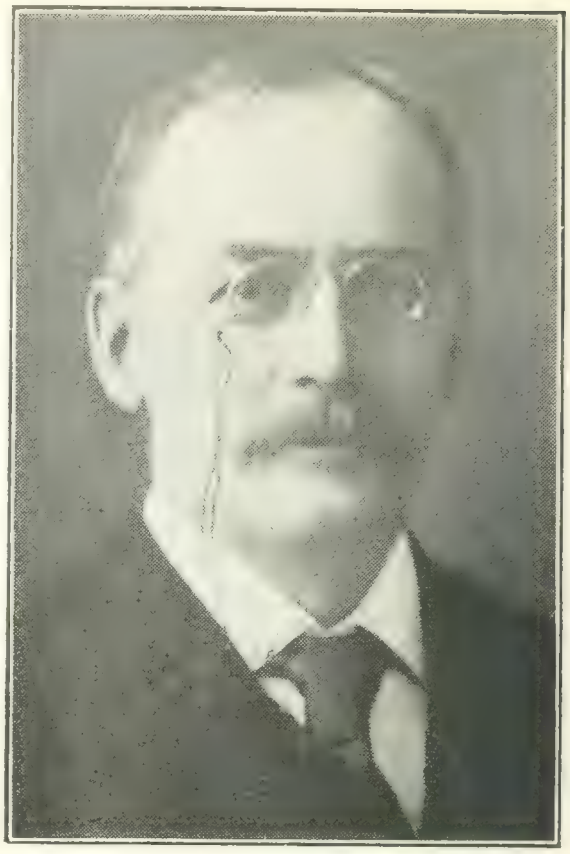
Mr. Gordon C. Edwards, of Ottawa, who has been for several years a valued and active Director of the Canadian Forestry Association, was on March 5 elected President of the National Wholesale Lumber Dealers' Association at its twenty-second Annual Meeting in Buffalo, N.Y. This is the leading lumber organization on the continent, and the election of Mr. Edwards, the first Canadian to hold the office, is a compliment to Canada, and to the Canadian lumber trade. At the same time the National Wholesalers have secured a most efficient President, and one who will add strength and popularity to their organization Mr. Edwards has occupied important positions in that Association for several years, and under his presidency 1914 promises to be the best year in its history.

Quebec, the Pioneer.

Quebec was the first province to have a co-operative forest protective association. The results of two years' operation were so satisfactory in the original association covering the St. Maurice Valley that now a new organization has been formed, which will cover a large section of the province between the St. Maurice and Upper Ottawa. This brings the co-operative plan up to the borders of Ontario, and if it proves again successful it will doubtless cross the Ottawa River into Ontario.

THE TREELESS FUTURE.

I dreamed of a child in the years to be,
My granddaughter's, grandson's son;
In the light of a radium stove sat he,
His history lesson to con.
He came to a word that his knowledge tried,
He spelled it three times three;
Then asked of the ancient man by his side,
'Say, grandfather, what is a tree?'



Mr. F. C. Whitman, Vice-Pres. Canadian Forestry Association.

TREES.

By M. Blanche.

In serried rank or lonely state,
Like veterans they stand,
Through starry night, through storm-swept days,
To sentinel the land.

I know not if I love them best
When fledged with springtime green,
Or when, with silvan vesture clad,
They deck the summer scene.

And yet when autumn touches them
With dyes unknown to art,
Beneath that gorgeous color-spell
I needs must yield my heart.

But, ah! I know I love them well
When, all white winter through,
With gray and lacelike tracery,
They etch the curving blue.

A movement has sprung up among the lumber jacks on the coast and islands of the Gulf of Georgia, B.C., to become permanent settlers instead of roving laborers without homes. The Government is assisting the movement by all means.

Ontario Co-operative Work in Forestry

Paper read by Mr. E. J. Zavitz, Provincial Forester, at the Experimental Union, Ontario Agricultural College, Guelph, Ont., Jan. 14, 1914.

This last season the Forestry Department distributed some 200,000 forest tree seedlings and transplants to private owners throughout the Province. These plants went into twenty-nine counties. The distribution of trees for this last season has been, as far as numbers are concerned, smaller than that of previous years. This is partly accounted for by the evident lack of labour throughout the Province. A number of applicants were unable to handle the work and notified us that they were afraid that they would not be able to carry out the experiment owing to lack of labour.

At the present time we have experimental plantations in practically every county in the Province. These plantations vary in size from one-eighth of an acre to 10 acres, and in a few cases even larger.

During the first five years of the life of the plantation, it does not make very much of a show, as the plants are very small when sent out from our nurseries. As the plantation gets up to the sixth year, it begins to draw attention, and I anticipate that the influence of these experimental plantations throughout older Ontario, will have a strong educational value.

The bulk of our plantations are made upon soils more or less unfit for agriculture. The plantations are made on steep hillsides, sand formations and upon blow sands, which interfere often with township roads. This last form of planting on sand which is drifting across county or township roads is an interesting feature of our work.

There are a great number of places in the Province where light sand ridges intercept the highway. In many cases where this sand has started to shift it is interfering with the condition of the roads. Scotch pine and jack pine thrive in the very poorest sand, and it is a comparatively simple matter to form plantations upon these light soils.

In our circular we have advocated the planting of waste portions of woodlots and the introduction of evergreens into the composition of the woodlot, but this form of planting seems to have appealed to very few.

The improvement in the condition of the Ontario woodlot is a most difficult problem. When we realize the difficulty in interesting the land owner in improving methods relating to annual crops from which he derives his livelihood, it can be readily understood

Hon. W. H. Hearst, Minister of Lands, Forests and Mines for Ontario.

that in the case of the woodlot, which only gives small returns, with the long time element a factor, it will be difficult to secure radical improvements. Here and there we find men prepared to protect their woodlands and improve them for the good of the future.

There is probably little change during the last five years in the percentage of woodlots in the Province, but there is certainly a gradual change for the worse in the quality of the woodlot. The better classes of trees are gradually being taken out and little attention is being paid to the future results of the cutting.

We are receiving splendid assistance from a number of the district representatives of the Ontario Department of Agriculture throughout the Province, and in counties where these men are taking some interest in this matter there is a noticeable increase in the number of plantations asked for. I

anticipate that the district representatives will aid very much in the solution of this problem as in many others.

At the Forest Station, in Norfolk County, our nurseries are being improved and better organized, and we will be able to meet the demand for forest nursery stock on a large scale in the future.

Mr. F. S. Newman, B.Sc.F., has been appointed assistant to the Forestry Branch, and will have direct charge of this work.

At the present time there are about one million plants in our nurseries and about 500,000 of these are ready for distribution this coming season.

In last year's planting, at this station, we used about 200,000 plants. The older plantations at this station are proving very satisfactory and encouraging. In addition to the experimental value of these plantations, I feel that there is a local influence which is quite noticeable. Our plantations on the blow sands, which at first were more or less ridiculed, have proven successful, and now a number of people throughout the country are taking advantage of the distribution of trees and making plantations upon similar situations.

I believe that with the solution of the labour problem and the general improvement which is coming throughout older Ontario, there will be a healthier interest taken in the reclamation and reforesting of poorer soils of the farm.

Group of B. C. District Foresters at Victoria, B.C.

B.C. Foresters' Conference.

'We have benefited wonderfully by this Conference, and I am sorry you could not be present,' writes Chief Forester H. R. MacMillan in reference to the Conference of District Foresters and Forest Assistants held at Victoria, B.C., recently. The Conference was a gathering of all the field men of the British Columbia Forest Service to discuss problems arising in the work and the results of this meeting were very satisfactory. The picture shows the men of the B. C. Forest Service gathered in front of the Forest Department Office. Our eastern readers will recognize many of those in the group. Chief Forester MacMillan is in the centre, wearing a light-colored overcoat.

PROMOTION ON MERIT.

There is only one way to have a high standard of efficiency in the public service and that is by appointment made purely on merit, and for tenure of good behavior with a system of promotion on merit. When that is the rule all over Canada it will be a benefit to the whole Dominion...*Quebec Chronicle.*

The Argentine Touring Club has decided to award a special gold medal annually to the landowner in the Province of Buenos Aires who plants the most trees at the sides of the public highways. The trees may be fruit or forestal, and instructions and advice concerning planting may be had from the Touring Club.

Western Forestry and Conservation Association

For the first time the Western Forestry and Conservation Association, comprising the associations of Montana, Idaho, Washington, Oregon and California, and of British Columbia, met in Canadian territory, the sessions being held in Vancouver on Dec. 15 and 16, 1913.

About one hundred lumbermen were present when President A. L. Flewelling of Spokane opened the meeting. With him on the platform were Mr. E. T. Allen, Forester and Manager of the Association, and Mr. Geo. M. Cornwall, Editor of the *Timberman*, Portland, Oregon, Secretary-Treasurer. After the President's address, Mr. Allen gave his review of the year's work, concluding with the following epigrammatic summary: 'A season of average fire hazard, but a loss of less than $1,000, is the compiled report of the local associations. The area patrolled was 22 million acres. This contains over 500 billion feet or one-fifth of the nation's entire supply. The area of merchantable timber burned over was 2,810 acres, or one-eightieth of one per cent. Actual destruction was 583,000 feet, which is one-one-thousandth of one per cent. This is far better than the best previous record, that of 1911. The cost of this year's work was about $200,000, which is less than 1c an acre for the area guarded, although nearly a two cents per acre charge on contributing holdings. About 475 regular patrolmen were employed. Hundreds of miles of trail and telephone line were built.

Hon. W. R. Ross.

Hon. W. R. Ross, Minister of Lands for British Columbia, dealt in some detail with the work of the B. C. Forest Branch. Probably seventy per cent. of British Columbia's two hundred and fifty million acres, he said, was under some kind of timber. Timber was destined to be the greatest crop that could be raised in the province, and since the bulk of the forest land was Crown property and the chief source of public revenue (yielding three million dollars annually) the protection of the forest and the most scientific method of obtaining revenue from it, were two of the most important functions of the Government. Eight and one-half million acres of the forest lands had been placed under a license system which called for payment by the operator at the time when the principles of modern forest finance require that it should be paid, namely, when the timber crop was cut and marketed.

He believed that they had in British Columbia an almost ideal method of co-operation between Government and private interests, in the form of the forest protection fund and the organization that the fund had rendered possible in the province. During the past year over one hundred and fifty million acres of the total area of British Columbia had been placed under some form of protection. They had maintained over this area a skeleton organization capable of being recruited to any extent that fire danger might require. Under the excellent weather conditions during 1913 the eleven forest districts had been provided with thirty rangers, and two hundred and eighty guards and patrol men; another one hundred men being at their call at short notice if required. This force had experienced no difficulty in controlling the situation, for, though nearly six hundred fires had been reported, three out of every four had been extinguished without extra cost. Full use had been made of this favourable situation. Numbers of the men had ben drafted to improvement work. Fire fighting had cost only $9,000. Patrol expenses involved $190,000. Out of the total fund for the year, amounting to $350,000, they therefore had an ample balance for construction work. The department had thus been able to construct since August, 1913, 1,000 miles of horse trails, 168 miles of foot trail and 360 miles of telephone line, 10 cabins and 10 mountain lookout stations, the cost of these being $67,000.

Fire Fighting.

Mr. H. S. Graves, Chief Forester of the United States, owing to illness in his family, was prevented from attending, but his paper was read by Secretary Cornwall. In it Mr. Graves stated that fires could be extinguished both in normal and in dry seasons by making adequate preparations and having an adequate staff. He urged the fullest co-operation between federal and state authorities and private owners.

In the discussion which followed, the lumbermen were generally favourable to the fullest co-operation. Throughout there was a strong testimony to the efficacy of oil-burning engines in preventing the setting of fires. Equally strong was the condemnation of smoking in the woods by employees, and several of the leading operators held that it would be just as easy to prohibit smoking in the bush as it was in the coal mines.

There was an animated discussion on

slash burning, the general opinion being strongly favourable, and in this respect was summed up by President Flewelling in the statement that it should be made imperative that slash should be burned, leaving it to the different associations to fix the right time.

Regarding wireless telegraphy, it was felt that it might be made of use in supplementing the regular telephone system, but that further improvements were required before it could replace the same.

Mr. Clyde Leavitt told of the work being done, under the Dominion Railway Commission and the different Governments, by the railways to reduce forest fires from this source, while Mr. R. D. Prettie, Superintendent of Forestry for the Canadian Pacific Railway, presented the railway side of the case.

British Columbia Regulations.

The next section of the program was devoted entirely to British Columbia. Mr. J. F. Paterson, President of the Paterson Timber Co., Vancouver, read a paper which he said had been framed with the object of putting the British Columbia forestry department on the defensive, and he had no doubt that Chief Forester MacMillan and his associates would be able to take care of themselves in the reply. Mr. Paterson's first criticism was that the B. C. coast climate was so damp that there was need for protection for only about four months in the year, yet the Forestry Department organization called for a staff which could only be profitably employed during about a quarter of each year. The Chief Forester was evidently endeavouring to get value for every dollar expended. No serious complaints had been made, but it was safe to venture the assertion that even with the most careful measures considerable money would be 'handed over in the form of what might be called political charity to appointees who have to be in some way rewarded for political services to the member representing the district in which they are employed.' In regard to trail building on which $150,000 had been expended, Mr. Paterson doubted whether some of this might not be unwise expenditure, as opening up to tourists and others districts which were now free from such dangers by their inaccessability. In view of the fact that half the cost of fire protection was borne by the lumbermen, he suggested that there should be some advisory committee elected by the timber holders to consult with the Government as to the expenditure of the fund.

Mr. Peter Lund of the Crow's Nest Pass Lumber Co., Wardner, B.C., said that the organization of the B. C. Forestry Department had been watched by the interior lumbermen with interest, and the results achieved had been most gratifying to them. He combatted, however, a recent statement of Hon. W. R. Ross, Minister of Lands, that lumber prices in Canada up to 1909 had risen faster than those of any other group except furs. He also contended that owing to the light stand of timber in the interior the ground rent should be about half what it was on the coast.

Chief Forester MacMillan said that the problem was to protect 250 million acres of forest land with a fund of about $350,000. He could not agree with Mr. Paterson when he said that coast timber would not burn. A view of Mr. Paterson's old camps would show that it would. They were not trying to carry this work out on their own experience, but on the experience of all the associations of the Pacific coast. Two means used were: legislation to prevent and control the setting out of fires, and the patrol to protect against the fire hazard. No trail was cut without a most careful study of the situation, generally extending over a year. In a large proportion of the cases there was an application from the lumberman for the improvement. As to wasting money, not a dollar was spent under cover. Every patrolman was visible, and every piece of work could be inspected by the public. He welcomed the suggestion of the establishment of an organization through which the lumbermen could act with the Government.

Mr. R. H. Alexander of the Hastings Mill acknowledged the difficulty of the problem, and was glad to know that Mr. MacMillan was ready to receive assistance from the lumbermen in regard to the disposal of the fire protection fund.

Mr. Michael Manson of Vancouver Island stated that in the district which supplied sixty per cent. of the timber cut in B. C. every one of the fire wardens was recommended for appointment by the timber owners.

The convention concluded with a banquet tendered by the lumbermen of British Columbia.

Mr. John Hendry, president of the British Columbia Mills, Timber & Trading Company, Vancouver, presided over the gathering, having on his right Judge Flewelling, Hon. W. J. Bowser, attorney-general of British Columbia, E. T. Allen, and Mr. W. A. Anstie, president Mountain Lumbermen's Association; and on his left Hon. W. R. Ross, Minister of Lands, and Messrs. T. J. Humbird, Spokane; Geo. M. Cornwall, association secretary, Portland; and H. R. MacMillan, Chief Forester. Mr. R. H. Alexander, general manager of the Hastings Mill, officiated as vice-chairman. The affair was a great success and a fitting conclusion to the convention.

The Convention City—View of Part of Waterfront, Halifax.

The Convention City—View in Public Gardens, Halifax.

CO-OPERATION EXTENDING

When last month we stated that we should return to certain features of the work of the St. Maurice Forest Protective Association, we did not think events would occur so rapidly. As a result of the successful two years' work of that association, another has been organized to protect the forests in the valleys of the Nation, Lievre, Rouge and Gatineau rivers.

Upon invitation from some leading lumbermen, representatives of the St. Maurice Valley Association came to Ottawa on March 11, and explained the work of the former association to a number of gentlemen owning timber on lands to the west of the St. Maurice. The chair on this occasion was occupied by Senator Edwards, and the workings of the association were explained by Mr. S. L. de Carteret, President; Mr. Ellwood Wilson, Vice-President; and Mr. Henry Sorgius, Manager and Secretary.

Their reports so favourably impressed those present that on March 20 a second meeting was held at the Chateau Laurier, Ottawa, when Senator Edwards again occupied the chair. A committee was formed to organize an association to be called the Canadian Forest Protective Association to take steps for its incorporation, and to appoint a manager.

It is expected that the organization will be so far complete that the work of protection on a co-operative basis may be begun this year. Lookout stations will be erected, trails opened, and telephone connections made as far as possible. The work will be on the lines of the older association. Among those who explained the work of the St. Maurice Association on this latter occasion were Messrs. de Carteret, Wilson, and Mr. J. B. White of Montreal. Mr. Overton Price of Washington, D.C., consulting forester of British Columbia, was present, and from his experience strongly urged the formation of such an association. Mr. W. C. J. Hall, Chief of the Forest Protective Branch of the Quebec Department of Lands and Forests, represented the Department.

The committee appointed to organize the association consisted of the following gentlemen: Senator Edwards, Mr. J. B. White, Mr. R. M. Kenny, Mr. George H. Millen and Mr. Ward C. Hughson.

Among the firms and their representatives present were:—Senator Edwards, Gordon C. Edwards and J. A. Cameron, of the W. C. Edwards Co.; George H. Millen and J. F. Rochester, E. B. Eddy Co.; P. C. Walker, Shepherd-Morse Lumber Co.; Sir Henry K. Egan, Hawkesbury Lumber Co.; J. C. Browne, Fraser & Co., Ottawa; J. H. Black, of J. R. Booth & Co.; Grant P. Davidson and James Davey, Davidson Estate; W. C. Hughson and A. E. Maxwell, Gilmour & Hughson; R. M. Kenny, E. J. Graham and J. E. Rothery, of James MacLaren & Co., Buckingham; J. B. White, Charles Read, Jr., and John Gwynne, Riordon Pulp and Paper Co.; Clyde Leavitt, forester, Commission of Conservation, and Arthur H. Graham, Government forest agent, Arundel, Que.

British Columbia Timber Royalties

The Timber Royalty Act, fixing new royalties on different classes of timber, has been introduced in the British Columbia Legislature by Hon. W. R. Ross, Minister of Lands.

The Minister, in introducing the Bill, pointed out that the plan adopted came as the result of long, careful study and consultation with lumbermen and timber owners. He said he had never looked on this question merely as a means of raising money, but as fundamentally affecting forest policy. He desired to do three things in this Bill:

'First, so to settle this royalty question as to insure to the highest practical degree the welfare of all the people in British Columbia as far as the forests contribute to their welfare, and that is very far. Second, so to handle this question that the Government co-operates to the fullest legitimate extent in establishing and maintaining a permanent and profitable lumber industry in our Province; and third, so to handle this matter as to make forest conservation not a remote, but a nearer and more probable thing upon all timber limits.'

He felt that this was a conservation measure, and he wished to say that he had not applied by wholesale plans framed for some other country, but had worked out a Bill drafted for British Columbia conditions. He continued:

'The Royalty Bill comprises these four things: It fixes the royalty increase for 1915, and establishes a level of lumber prices on which future increases will be based. It provides seven five-year periods for royalty adjustment; and it provides that for each of these periods a given percentage of the price increment for lumber shall be added to the royalty. This percentage is twenty-five per cent. for the first five years, and rises gradually to forty per cent for the last five-years period. The fourth of the accomplishments of the Royalty Bill is to re-adjust the rentals between the coast and the interior, and fix them for the whole period of the Act.'

'First, the royalty increase for which the bill provides takes effect on January 1, 1915. The bill provides that these increases shall be, for coast lumber, from the present royalty of fifty cents to seventy-five cents, an increase of fifty per cent. This increase, however, is not applied arbitrarily, but is the result of raising the royalty on different classes of logs in a proportion which puts the highest increase on the best logs, and no increase at all on logs of such low value that the increase would mean that they would be left lying in the woods. . . .

'The royalty increase in 1915 provides that in the interior royalty shall be increased by the use of the B. C. scale instead of the Doyle. That means an increase of probably forty-five per cent in royalty to the Government, and as far as I and my advisors can figure it out is an equitable adjustment of royalty between the coast and the interior. In the central and northern interior, regions of great prospective timber development, the Government has imposed in the Royalty Bill a royalty charge of sixty-five cents per thousand board measure. This again, in my best judgment, fairly represents the relative conditions as to lumber

Hon. W. R. Ross, Minister of Lands for British Columbia.

values in that region, as compared with the interior and coast.

'These three increases take place in 1915, and hold good for five years, or until 1920. Then comes the first readjustment based on increase on the actual lumber price of $18.00 fixed by the bill.'

That readjustment is explained in the following clause in the Bill: 'for a period of five years from the first day of January, 1920, the foregoing royalties shall be increased by an amount equivalent to twenty-five per cent of the increase (if any) in the average wholesale selling price of lumber, free on board point of manufacture, above eighteen dollars.

Similar readjustments occur in 1925, 1930, 1935, 1940, 1945 and 1950.

Hon. Mr. Ross said that coincident with its enactment the Bill would increase the timber royalty between $50,000 and $60,000. By 1914 if the annual lumber cut increased by an average of five per cent annually, and the price went up to $21 per thousand feet, the increase to the Government would be nearly $250,000 per year. He held the Bill was a fair one all around and satisfactory to both the people of British Columbia, for whom the Government were trustees, and to the lumbermen.

The tie question is becoming a very important one on the railways throughout the country. With the decrease in available timber ties comes the demand for a substitute for wood. In a recent report the Committee on Ties for the American Railway Engineering Association submitted the following conclusions, which show that, as yet, a perfect substitute for the wood tie has not appeared. The committee states that the concrete tie, a combination of concrete and metal tie, has not yet proved a success because of fracture caused by vibration, excessive weight, and consequent difficulty in handling, and the deterioration of the asphalt filling. A combination tie of steel and wood gives promise of developing an economic substitute. They add that the all-steel tie has proved a satisfactory substitute for the wood ties under heavy medium street traffic. It is durable, line and surface can be maintained, has sufficient resiliency, and can be insulated. The fastening so far in use can, and no doubt will, be improved.—*Canadian Engineer.*

ENCOURAGING WORDS.

In connection with the annual meeting the Canadian Forestry Association is in receipt of a number of encouraging letters from good friends of forest conservation. Several of these are given below.

From H.R.H. the Governor General.

Lieut.-Colonel Farquhar, Governor General's Secretary, writes: 'I am commanded by HIS ROYAL HIGHNESS THE GOVERNOR GENERAL to acknowledge receipt of your letter of March 9th, enclosing a copy of the resolution passed at the annual meeting of the Canadian Forestry Association.

'His Royal Highness commands me to say in reply that he is very glad to continue Patron of the Canadian Forestry Association, and that he sends his very sincere thanks to the members for the kindly wording of their resolution on the restoration of the Duchess's health, which he is glad to inform them continues to improve from week to week.'

From Directors.

HON. W. J. ROCHE, Minister of the Interior, Canada, writes that he has much pleasure in acceding to the request that he allow his name to be presented for election as Director.

HON. GEORGE H. PERLEY, Ottawa, one of Canada's leading lumbermen, in accepting the office of Director, writes: 'I quite agree that the objects of your Association are good and that everything possible should be done to impress on the people of Canada the necessity of preserving and perpetuating our forest wealth.'

HON. N. CURRY, SENATOR, of Montreal and Amherst, N.S., who, as head of several large manufacturing companies, is greatly interested in timber, especially in Nova Scotia, writes that he is glad to accept the post of Director, and adds: 'I am, of course, an extremely busy man, but will endeavour to attend the meetings as far as possible.'

From Territorial Vice-Presidents.

HON. W. H. HEARST, Minister of Lands, Forests and Mines, Ontario, writes: 'I have your letter of the 9th instant, and am grateful for the honor done me by your Association in electing me Vice-President for the Province of Ontario.

'I further note that I will be kept informed of the work of the Association, all of which will be of very deep interest to me.

'Wishing yourself and the Association all success during the coming year.'

HON. JULES ALLARD, Minister of Lands and Forests, Quebec, acknowledges the notification of his election, and adds: 'I have had opportunity to appreciate the sound work of the Association, especially in the study of means to be adopted for the intelligent management and the effective protection of our forests. The Canadian Forestry Association can rely upon my hearty support.'

HON. W. R. ROSS, Minister of Lands, British Columbia, writes: 'I beg to acknowledge receipt of your letter of the 9th February advising me of my re-election as Vice-President for the Province of British Columbia of the Canadian Forestry Association, and wish to express my appreciation of the honour thus conferred.'

HON. O. T. DANIELS, Attorney General and Commissioner of Lands, Nova Scotia, in accepting the office, adds: 'I shall be very glad to be kept informed of the work of the Association in connection with the care and preservation of the forests of the country and the development of forestry generally.'

The Vice-Chancellor of the Archdiocese of Montreal, acknowledges the notification of the election of HIS GRACE, ARCHBISHOP BRUCHESI, and continues: 'Archbishop Bruchesi wishes to thank you for this kind information and appreciates the honour very much, also your kindness in promising to send him information concerning the work of the Association.'

From a Saskatchewan Merchant

Many thanks for your kind letter of the 4th inst. which reached me today, and am very glad to learn that your lantern slide showing part of the green ash plantation has turned out so well and is creating interest in your good work lecturing to the public. I shall feel well repaid for my labours if I can be the means of inducing others to follow my example.

From a Winnipeg Railway Man

I have the object of the Association very much at heart, and if any experience I may have had dealing with forestry may be of any use to you, I shall be more than glad to place it at your disposal. That the railroads are alive to the importance of fire prevention and forest protection is evidenced by the action of the C. N. R. in having a man specially detailed to look after that end of the work. Wishing your Association all success.

From a Member who lives much abroad.

Do you make it clear enough that when our coal has all gone, if we keep the woods they [illegible] power, by electricity. If not we should have to get out of North America; probably, something like the Chinese who at one time held and governed the present City of Dresden and had probably to retire into Asia because of successive dry years which could not support their nation.

[illegible] Old Resident of [illegible] Ont.

My memory goes back to the latter 50's, 60's and 70's when I saw Norfolk County's lovely forest wealth in all its glory and beauty. As Mr. Geo. Hotchkiss, the Secretary of the Northwestern Lumbermen s Association with headquarters at Chicago, wrote me, Norfolk County had the finest pine timber that ever grew out of the earth. But it is all gone now, and ignorance, greed and stupidity have destroyed in the past, and now are destroying every woodland beauty spot we had. There are roads I will not travel on if I can help it because of the absence of our former lovely timber wealth. There is one word that for me expresses the way our forest riches in Norfolk County have been use, namely, 'brutal'.

HIS CONTRIBUTION.

Town Councillor.—'Have you heard, Mr. Skinflint, that our generous townsman, Mr. Cashbags is defraying the cost of a new promenade all around the town? We think a wealthy man like yourself might also do something for us.'

Skinflint.—'Well, what do you say to my giving you a park of oak trees?'

Town Councillor.—'Oh, you noble-hearted philanthropist! Why, do you really mean to—

Skinflint.—'Yes, yes; I'll make the town a present of an oak forest. You have only to find the land and I'll supply you with as many acorns as you may wish for seed.'

Strenuous Life in B.C.

Echoes of the strenuous life of a District Forester in northern British Columbia are found in the following extracts from a recent letter from H. S. Irwin, of Prince Rupert:—'We get all kinds of excitement out of logging inspection during the storms and fogs of a northern winter, in a small launch, and, as logging regulation is our chief worry in this district, trouble never ceases. We 'get ours' all the year round, while the average forester out here gets most of his 'bumps' concentrated into the summer

With the Forest Engineers.

(Contributed by the Canadian Society of Forest Engineers.)

Officers for 1914.

The following officers have been elected by acclamation for 1914:—

President—Dr. B. E. Fernow.

Vice-president—R. H. Campbell.

Secretary-Treasurer — Ellwood Wilson, Grand'Mère, Que.

The remaining four members of the executive committee, as decided by the last (1914) annual meeting, consist of the chairmen of the district executives, and will be elected later.

New Members.

The Secretary announces the election of the following new members:

Active—P. Z. Caverhill, D. C. A. Galarneau, Axel Gold.

Associate—R. D. Prettie, S. H. Clark, Alan Parlow, G. E. Bothwell, H. R. Christie, F. McVickar, B. M. Winegar, H. Sorgius.

Student—A. W. Bentley, J. F. L. Hughes.

New Brunswick Notes.

When in the Maritime Provinces Mr. James Lawler, the Secretary of the Canadian Forestry Association called on Professor R. B. Miller, in the Forestry Department of the University of New Brunswick at Fredericton. He briefly addressed the class and learned some particulars of the work. Professor Miller has been asked to take over the care of the shade trees of the City of Fredericton in addition to his work at the University. Mr. H. C. Belyea, a graduate of the class of 1911, was at Fredericton to give a two-weeks' course in cruising to the class. The University forest lands, lying immediately behind the college buildings, which comprise several thousand acres, were to be estimated and mapped in this work. The annual 'hammerfest' or dinner of the class was most successful this year.

A Summer in the Trent Valley, Ont.

Dr. C. D. Howe, of the University of Toronto Faculty of Forestry, writes:—

'My summer was spent with two assistants, Messrs. Aiken and Burford, making a detailed survey of limited areas in the Trent valley. The work was confined to the townships of Burleigh and Methuen in Peterborough county. Our object was to determine the effect of repeated fires upon the rate of reproduction of the commercial species, especially upon that of pine. These townships offer excellent opportunities for such study, for they contain areas ranging in character from those that have been burned but once down to areas that have been burned a dozen times since lumbering. We ran lines through the old burns of different ages and calipered all the trees above one inch in diameter. As you may imagine, this was slow work where the young trees averaged over 3,000 to the acre. On the other hand, it was easy work on the much-burned areas, where sometimes we found only half a dozen small poplars to the acre—this, too, in places where the stumps showed that an average of 25 or more pine trees per acre had been removed.

'The results of the work have not all been compiled as yet, but I may say in general that I was surprised and gratified with the abundance of young pine on the areas which have been burned only once. It is coming back again in commercial quantities. Such areas will prove a valuable asset to the Province, if they could only be protected from fire. On the other hand, the young pine on areas burned several times is about as scarce as hen's teeth in February.'

New Regulations in B.C.

Introducing a novelty in the form of grazing regulations is not all fun. Witness the following (written in December last) from the Dominion District Inspector of Forest Reserves at Kamloops, B.C.—'A meeting of stockmen held recently at Kamloops to consider the new grazing regulations of the Dominion Forestry Branch developed considerable opposition to these regulations. This opposition, however, when analyzed, is found to arise more from a natural objection to the Government's putting an end to free range than from a fundamental objection to the policy of administration itself. The writer took occasion, while at the Forest Fire Conference at Vancouver, to ask some questions of Mr. Silcox, U. S. District Forester for District One, where natural conditions are the same as at Kamloops. It was ascertained from him that the transition from free grazing to administration and revenue collection by the Government was accompanied by the same opposition there. Enforcement of the Government's policy, however, showed the stockmen in a very few years that they were much better off than formerly. The writer is convinced that a reasonable test will demonstrate this fact equally favourably to the stockmen in the Kamloops district.'

CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association is the organization in Canada for the propagation of the principles of forest conservation. This it does by means of conventions, meetings, lectures and literature.

It is a popular organization supported by the fees of members, assisted by some government grants.

There is a vast field of work before the Association which is only limited by the funds at the disposal of the Association.

Those who are not already members are invited to join and assist in the work. The membership fee is one dollar per year, and this entitles the member to attend and vote at all meetings and to receive the Annual Report and the *Canadian Forestry Journal.* Women as well as men are eligible for membership.

Applications for membership and requests for literature and information may be addressed to

The Secretary,
Canadian Forestry Association,
Journal Building, Ottawa, Can.

OBJECTS OF THE ASSOCIATION.

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains and on streets and highways.

(5) Reforestation where advisable.

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Canadian Forestry Journal

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THE HALIFAX CONVENTION.

Matters are progressing satisfactorily in regard to the Canadian Forestry Convention at Halifax, September 1-4. A number have already signified to the Secretary their intention of attending, and there is no doubt there will be a good attendance. This and the arrangements with the railways enables the Association to promise single fare rates for the round trip to members actually attending and their ladies.

Railway Arrangements.

Railway arrangements are on the *Standard Certificate Plan*. By this delegates purchase one-way first class tickets to Halifax and secure a certificate from the railway agent selling the ticket. These certificates will be signed by the Secretary at the Halifax Convention, and when thus signed will be honored for return tickets to the starting point.

Eastern Canadian Points.

From and including Fort William, Ontario, eastward tickets will be on sale at all railway stations in Canada Aug. 28 to Sept. 3, inclusive, and properly validated certificates will be honored at Halifax for tickets

for the return journey up to and including September 8.

Western Canadian Points.

In Western Canadian territory (namely, west of Fort William to the western boundary of Alberta) the dates of sale will be August 24 to 27, inclusive. Properly validated certificates will be honored for return tickets at Halifax up to and including September 19 for tickets back to starting point.

From British Columbia Points.

From British Columbia points the dates of sale will be August 22 to 26, inclusive. Properly validated certificates for return tickets will be honored at Halifax up to and including September 19.

Lake and Rail Routes.

These dates for British Columbia and Western Canada points will accommodate those desiring to travel by steamer across the Great Lakes. The usual arbitraries will apply for passengers desiring to use the lake route.

Delegates are requested to acquaint themsleves thoroughly with these dates and rules, as failure to observe them will render it impossible for them to get the reduced rate. The Secretary is anxious to get the names of those who expect to attend, and will gladly give information on any point not clear. Address: The Secretary, Canadian Forestry Association, Journal Building, Ottawa.

SPRING FOREST FIRES.

As this issue of the *Canadian Forestry Journal* goes to press forest fires are reported in all parts of Canada. The open winter, with comparatively little snow, was followed by a dry spring, with the result that fires have been unusually widespread. The only gratifying feature is the greater activity which is being displayed on the part of governments, co-operative organizations and private companies in fighting the fires.

CONVENTION NOTES.

From those who have already signified their intention of attending the Convention at Halifax Sept. 1-4 it is evident it is going to be one of the best yet held. A number are going to make it a holiday trip, on which they will take their ladies, as well as an occasion to help along the cause of forest conservation. The Secretary is shortly making a brief trip to Nova Scotia to make preliminary arrangements, but correspondence addressed to him at Ottawa will receive prompt attention. Write to him for information, and let him know you are going to attend.

THE PRESS IS WITH US.

The votes of thanks passed at our Annual Meeting are not formal, but mean what they say. It is pleasing to know that they are received in this spirit. The following note from Mr. John Imrie, Secretary of the Canadian Press Association, shows that the Canadian Forestry Association has the support and good will of this most powerful agency, without whose aid it would be impossible to carry on our propaganda work with anything like its present effectiveness:

'I am pleased, indeed, to learn from your letter of the 9th inst. that the Canadian Forestry Association appreciates so heartily the co-operation of the press of Canada in its work for the cause of forest conservation. It will give me pleasure to present the resolution of the Canadian Forestry Association on this matter to our Executive Committee at their meeting.'

CONCERTED ACTION NEEDED.

A member writing from Muskoka says: 'Forestry vitally affects us here in Muskoka, where hard and soft timber abounds, and its care and growth affects our welfare. Ignorance and greed militate very generally against a proper use of our magnificent forests, and there is much to be done amongst our people in the way of conservative administration of our bush, and reclamation of stripped and waste, and burnt areas. It seems to me no great improvement will be effected without concerted action on the part of individual owners, Municipal Councils, and the Provincial Government.'

Saskatchewan Forest Reserves Increased.

Recent Additions Quadruple the Reserve Area in the Province.

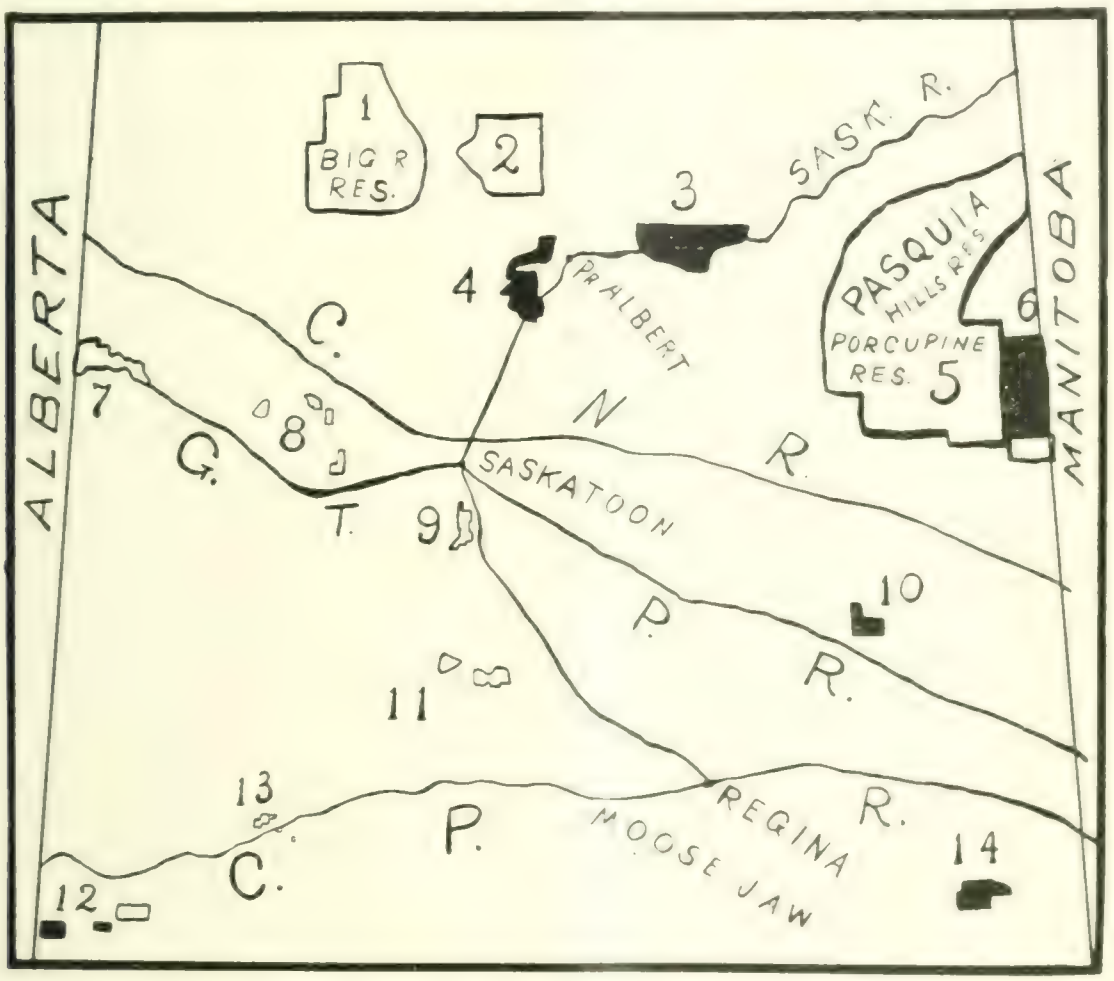
Attention has been called frequently in the past in these pages to the fact that Saskatchewan with very heavy needs in regard to timber and fuel was the worst off of all the western Provinces in regard to forest reserves. The figures at the end of 1913 were:—

Alberta	26,271	square miles.
Manitoba	4,108	" "
British Columbia . . .	3,782	" "
Saskatchewan	1,801	" "

By an Act just passed during the 1914 session of Parliament the area of the Saskatchewan reserves has been increased by 7,910 square miles, bringing the total up to 9,711 square miles. The additions consist of two classes:

First, non-agricultural tracts comprising small areas scattered throughout the prairie country. These tracts are nearly all sandy and broken and have little or no timber upon them. It will be necessary in nearly all cases to provide for reforestation by artificial means, but if these tracts are forested they will be a great assistance to the settlers in the prairie districts surrounding them.

The second class of reserves are the larger areas forming the watersheds between the Saskatchewan and Assiniboine Rivers and between the Saskatchewan and Churchill Rivers. These are very important watersheds, and are the source of supply of timber for a great settled area of prairie lying to the south. They are elevated and broken and not of agricultural character, but they grow good timber.



Map of the Province of Saskatchewan.

This shows the old forest reserves in black, and the new reserves in outline. The names of the reserves are as follows: 1, Big River Reserve; 2, Sturgeon; 3, Fort a la Corne; 4, Pines and Nisbet; 5, Pasquia Hills and Porcupine; 6, Present Porcupine; 7, Manitou; 8, Keppel; 9, Dundurn; 10, Beaver Hills; 11, Elbow; 12, Cypress; 13, Seward; 14, Moose Mountain.

Annual Report British Columbia Forest Branch

The report for the year ended Dec. 31, 1913, of the Chief Forester of British Columbia, Mr. H. R. MacMillan, to the Hon. W. R. Ross, Minister of Lands, is a most important document.

Forest Revenue.

In addition to the usual letter press of such reports, there are a number of diagrams which help to enforce the points of the report. One of these diagrams shows that the forest revenue of British Columbia amounts to $6.63 per head, whereas that of Ontario is only 79c per head, and Quebec 77c per head. Another diagram shows that royalties from timber cut in British Columbia during the twelve months amounted to $489,377, whereas those of Ontario amounted to $1,339,957, and those of Quebec to $1,173,393. In spite of financial stringency during the past year, the branch collected, during the twelve months ending December 1st, a revenue breaking all previous records, and amounting to $2,832,788, which is $229,669 greater than the revenue for the twelve months ending December 1st, 1912.

The total forest revenue, including taxation on Crown-granted timber lands, for the twelve months ending December 1st, was $2,999,579. The estimated expenditure for the branch for the fiscal year ending March, 1914, is $245,754.

The forest protection fund, to which the government and the timber owners contribute equal sums, is estimated, for the year ending March, 1914, at $350,682.

Importance of the Lumbering Industry.

Even today, with the trade undeveloped, except with the Prairie Provinces, lumbering constitutes the financial backbone of British Columbia. Half the industrial capital of the Province is embarked in lumbering, and half the pay roll and 37% of the production come from the same source. The report looks for great development with the opening of the Panama Canal, the development of eastern markets, and of the general over seas trade.

Says the Report: 'In the collection of forest revenue the returns of the Forest Branch show a cut of 1,457,000,000 feet, board measure, for the year 1913, an amount which is nearly equal to the combined output of the Provinces of Ontario and Quebec for the previous year. If the large amount of material used in railway construction during the year be included, British Columbia's total cut would approach 2,000,000,000 feet. The number of saw and shingle mills exceeds 425.'

Logging Inspection.

There were 794 logging operations in progress during 1913 on timber lands, on which a royalty, or tax, had been reserved to the Crown. The product of these operations for the calendar year 1913 was, approximately, 1,348,000,000 feet of logs, 82,805 cords of shingle-bolts, 3,030,010 lineal feet of piling, 35,000 mining-props, 15,500 cedar posts, and 5,093,718 lineal feet of cedar poles. The report states that there are few cases of intentional trespass. Absence of clearly marked survey lines and duplicate unofficial surveys account for most of them.

Clean Logging.

It is admitted that clean logging will depend upon the lumber market, for when there is no market for low-grade lumber the logger will feel disposed to leave low-grade logs in the woods. The general study which has been made up to date shows, however, that even under the market conditions, which have governed during the past few years, a great dael of material has been left to rot which could have been taken out profitably. The Forest Branch is working to reduce this waste.

Forest Insect Damage.

During the past two years timber owners have reported instances of destruction of merchantable timber by insects. Investigations in the Pacific States have shown that insect depredations can be controlled economically, and, with this end in view, arrangements were made last year with Dr. C. Gordon Hewitt, Dominion Entomologist, for a co-operative study of forest insects. Mr. J. M. Swaine, Entomologist for Forest Insects, spent the summer in British Columbia. His report has already appeared in the *Canadian Forestry Journal*.

Export of Forest Products.

The Report notes that the life of the timber industry of British Columbia depends upon profitable export, because the local population uses less than one-fifth of the timber production of the Province. The chief markets are the Prairie Provinces, the United States and Eastern Canada, and the sea-borne cargo trade. These are discussed at length, and measures for their development indicated.

Land Examination.

Noting the fact that Eastern Canada has found, along with older countries, that settlement on non-agriculture timber lands is not in the public interest, the Report points out that lands east of the Cascades bearing timber in excess of 5,000 feet per acre, and lands bearing in excess of 8,000 feet west of the Cascades are not open for sale or pre-emption. All expiring timber leases remain in forest reserve until examined and found valuable for agricultural purposes. In pursuance of this policy, 662,280 acres were examined in the year and maps and detailed information furnished to the different government departments.

Forest Reconnaissance.

Until recently the forest exploration of British Columbia depended upon private individuals. Little was known except that eleven million acres of merchantable timber had been taken up under grant or lease, and that a considerable portion of the rest of the Province was forested. To find out what these remaining 239,000,000 acres contained, the Forest Branch has entered upon a reconnaissance survey. In 1912 5,616,000 acres were surveyed, and in 1913 12,308,000 acres. This was in addition to the acreage covered by land-examination parties, or reported on by district foresters.

Forest Fire Protection.

The year 1913 was unusually favorable as regards forest fires. The total damage caused by forest fire during the year was only $18,354, as against $313,273 in 1912. The damage to standing forest was only $4,387, as against $200,000 last year. Fires covered and damaged to a greater or less extent less than 6,000 acres of merchantable timber and 2,000 acres of valuable second growth; 2,535 acres of slash was also burned, making a total of 10,270 acres, as against over 150,000 last year.

The fire protection force for 1913 totalled, in midsummer, 320 men, as compared with 212 in 1912. The total area under administration was 150,000,000 acres. The total cost of patrol alone was $190,000. There was a total of 578 fires. The four chief causes of fire are thus set out: Campers, 148; railway locomotives, 110; unknown, 104; railway construction, 62.

Burning Permits.

The plan of issuing permits to those desiring ot clear land or burn brush has been very efficient in the way of keeping down fires from this cause. During the year a total of 11,925 permits were issued to burn brush covering 31,102 acres. Of these 11,255 were for farmers desiring to clear land, 157 for loggers burning slash; 458 for burning railway right-of-way, and 55 for public road building.

Permanent Improvements.

Owing to good weather conditions in regard to forest fires, a much larger fund than had been expected was available for permanent improvements. In all 1,200 miles of trail, 360 miles of telephone line, and ten ranger, or shelter, cabins were constructed. The Branch owns and uses twenty launches, ranging from twenty to fifty feet in length, and twenty row boats and canoes are used in the patrol service.

The Convention Province—One of Nova Scotia's Beauty Spots, Second Lake, Dartmouth.

Dominion Forestry Branch.

Recent Changes in and Additions to the Personnel.

There are in all sixteen survey parties in the field this year:

Mr. E. B. Prowd, assisted by Mr. H. A. Porteous, will be in charge of the Eastern Manitoba survey. Mr. D. German, assisted by Mr. R. M. Watt and Mr. J. L. Ketchum, will conduct a survey in connection with the Duck Mountain Forest Reserve. In Saskatchewan, Mr. A. V. Gilbert, assisted by Mr. D. Greig, has been placed in charge of the Saskatchewan Survey No. 1. Mr. G. S. Smith has been transferred from head office to take charge of the Saskatchewan Survey No. 2. He will be assisted by Mr. G. M. Dallyn. Mr. K. Vavasour, assisted by Mr. H. M. Hughson, has been placed in charge of Saskatchewan Survey No. 3. The Cold Lake Survey party has been placed in charge of Mr. T. F. Rance, assisted by Mr. F. J. McGibbon, and the Pelican Mountain Survey is being conducted by Mr. A. B. Connell, assisted by Mr. H. A. Parker.

Five survey parties have been organized in connection with the Alberta Inspection District. Mr. T. H. G. Clunn, assisted by Mr. R. D. McDonald, is to take charge of the traverse party operating in connection with the Clearwater Forest Reserve. A timber berth survey party is to be operated by Mr. A. Gorman, assisted by Mr. J. B. Hipwell.

In connection with the British Columbia Inspection District, two survey parties will likely operate,—one, the British Columbia Reserves Survey party, under Mr. A. M. Thurston, assisted by Mr. J. F. L. Hughes,—the other, the British Columbia Reconnaissance, under Mr. C. R. Mills, assisted by Mr. R. A. R. Campbell. Besides these, a special survey will be conducted in connection with the Saskatchewan Forest Reserves, under Mr. L. Stevenson, assisted by Mr. J. Kay.

Mr. G. E. Bothwell, forest assistant, was transferred from head office to assist in the administration of the Athabaska Forest Reserve. Mr. F. D. Brown, forest assistant, has been transferred from the Brazeau Forest Reserve to assist in the administration of the Clearwater Forest Reserve. Mr. S. H. Clark, who has been acting forest supervisor of the Athabaska Forest Reserve, has been transferred to the supervisorship of the Brazeau Forest Reserve.

The fire ranging in Manitoba and Saskatchewan has been reorganized, placing the administration in the hands of the district inspectors, Mr. F. K. Herchmer and Mr. G. A. Gutches, respectively, leaving the inspection of the fire ranging in Alberta in the hands of Inspector E. H. Finlayson, whose headquarters will be at Calgary.

Mr. A. G. McIntyre resigned from his position as superintendent of the forest products laboratories in connection with McGill University on the 1st April. His place was taken by Mr. J. S. Bates.

Mr. F. McVickar resigned from his position as forest assistant in connection with the Bow River Forest Reserve, Alberta, on the 30th April. Mr. O. M. Savre, forest assistant, was transferred from the Athabaska Forest Reserve to the Brazeau Forest Reserve on the 1st April. Mr. D. W. Lusk, forest assistant, left Ottawa on the 4th May to take up his duties in connection with the British Columbia Forest Reserves. Mr. James McLean has been appointed superintendent of the forest nursery station at Sutherland, Sask., to take the place of Mr. W. B. Guiton, who has been transferred to the position of inspector of tree planting in connection with the forest nursery station at Indian Head. Mr. R. C. Miller of White Horse, Yukon Territory, has been appointed district fire inspector to take the place of Mr. Percy Reid, who has been transferred to Ottawa in connection with the Immigration Branch.

Mr. W. J. Boyd, who had charge of the fire ranging in Southern Manitoba last season, has undertaken a survey and inspection trip by canoe from Athabaska Landing through the northern part of Alberta into the Mackenzie and Yukon Districts. Mr. Boyd is accompanied by Mr. E. S. Davison of Toronto School of Forestry, and in the course of his trip will report on the reindeer and wood buffalo propositions together with the forest conditions of that country.

Mr. G. T. Robb has been appointed chief fire ranger of the Prince Albert Fire Ranging District, to take the place of Mr. A. Williscraft, who has been appointed to the position of forest ranger in charge of the Nisbet Forest Reserve.

Mr. J. A. Doucet, who was in charge of the Peace River survey last year, will obtain statistics in wood industries, etc., in Quebec.

HALIFAX, SEPT. 1-4.

Don't forget the Convention date. Write the Secretary that you will be there.

See this at the Convention—View in the Public Gardens, Halifax.

ARBOR DAY IN QUEBEC.

Arbor Day was celebrated in Quebec with unusual ceremony on May 14. The scene was the Quebec Exhibition Grounds, on the outskirts of the City of Quebec. The guests of the Exhibition Commission for the ceremony assembled at the City Hall at 2.30 p.m., and were taken to the park in automobiles. At the grounds they were met by His Honor Sir Francis Langelier, Lieutenant Governor, and Lady Langelier, attended by Captain Victor Pelletier, A. D. C. About two hundred were present for the ceremony, including Hon. J. E. Caron, Minister of Agriculture for Quebec; His Worship Mayor Drouin, of Quebec; Hon. Cyr F. Delage, President of the Quebec Exhibition Commission, and Mr. G. Morisset, Secretary; Mr. William Power, M.P., President of the Canadian Forestry Association; Mgr. Rouleau, rector of the Normal School; Mr. Avila Bedard, Professor of the Quebec Forestry School, Laval University. There were also present a number of members of the Legislature, members of the City Council, Directors of the Exhibition Commission, students of the Forestry School, and prominent citizens. His Honor the Lieutenant-Governor planted the first tree, taking the spade from the gardener and filling in the sod, amid general applause. Trees were also planted by Lady Langelier, Mde. Delage, Hon. J. E. Caron, Mr. Wm. Power, M.P., His Worship the Mayor, Mgr. Rouleau, Mr. Eug. Leclerc, Hon. Mr. Roberge, Ald. J. Collier, and Ald. G. Gibson. Mr. Power, as President of the Canadian Forestry Association, was called upon for a speech upon the occasion. He briefly explained the aims of the Association, and said it was in agreement with all efforts to make people realize the importance and necessity of the forests. He spoke of the beginning of the work in Canada, and, in planting the tree assigned to him, dedicated it to the memory of Sir Henri Joly de Lotbiniere, one of the fathers of forestry in Canada and the first President of the Canadian Forestry Association. After the planting ceremony had been concluded the directors of the Exhibition Commission conducted their guests to the Grecian Temple, where a group photograph was taken, after which all repaired to the Administration Building, where refreshments were served.

The Chief Game Warden of New Brunswick has made his Annual Report of the number of deer killed in that province in 1913. The figures are as follows: moose, 1,499; deer, 2,075; caribou, 454; a total of 4,028. These figures are interesting in view of the statement in a history of New Brunswick published in 1825 to the effect that the last moose had vanished from the forests of that province. These figures also show what can be done by proper methods of game protection, and the same holds true in regard to forest protection. New Brunswick's revenue from game licenses is more than sufficient to pay its present fire and game protection organization.

Report on the Trent Watershed.

There has been issued by the Commission of Conservation of Canada the report on *The Trent Watershed Survey*, compiled by Dr. C. D. Howe and Mr. J. H. White of the Faculty of Forestry, University of Toronto, with an introduction by Dr. B. E. Fernow. The report comprises 156 pages and is illustrated with 32 half-tone engravings and three maps.

The district covered by the report is in the central part of Southern Ontario, and lies along the line of the Trent Valley Canal, which is ultimately to connect Lake Ontario with Georgian Bay. The region surveyed is about midway between these two bodies of water. It takes in part of the counties of Haliburton, Peterborough and Hastings. This district was once a great pine forest. Owing to the fact that the Dominion Government has invested $10,000,000 in the Trent Valley Canal, and owing to the further fact that the navigation and water-powers on the canal are vitally related to the forest cover in the district, the Dominion Government is more directly interested than in other parts of the country. The Ontario Government is interested in the matter of timber dues and land sales, while all the municipalities are interested because of the municipal needs of the district and the question of the taxes to be derived therefrom.

The report states that the area is typical of much of the cutover lands of Eastern Canada for which it is desirable to formulate a policy of recuperation. The surface of the country is broken and hilly, interspersed with innumerable small lakes. The soil is underlaid with rock which is laid bare by repeated burning of the timber and young growth.

The report covers farming, forest, industrial, mining and tourist traffic conditions in the area considered. It states that only 15,000 people inhabit the 2,100 square miles of the watershed (a decrease since 1901 of 15 per cent.), and that hardly 10 per cent. of the region has been cleared for farm purposes. The soil is altogether unsuitable for agriculture, and run-down and abandoned farms are to be found in large numbers. Nearly 200 farms were for sale for unpaid taxes in 1911 at 6 cents per acre.

Practically all the pine has been removed. The whole area has been burned over at least once. Almost one-half the area is covered with young and second-growth trees of the poplar-birch type, the result of fires.

It was found, however, that enough hardwood and wood of the poplar-birch type remain to warrant the adoption of a policy of conservation, and Dominion, Provincial or municipal ownership of the territory in question is suggested by the Commission as an initial step in that direction. Other recommendations are: the re-possessing by the Province of the licensed lands which have practically ceased to produce the quantity of logs contemplated under original licenses; the imposing of restrictions on existing limit holders, tending to protect the forest growth; the appointment of a forester charged with the surveillance of the region; the perfecting of a fire-protection organization, building of look-out stations and watch towers, and appointment of the game-wardens as fire-wardens.

Copies of this report may be had by those interested by applying to the Commission of Conservation, Ottawa.

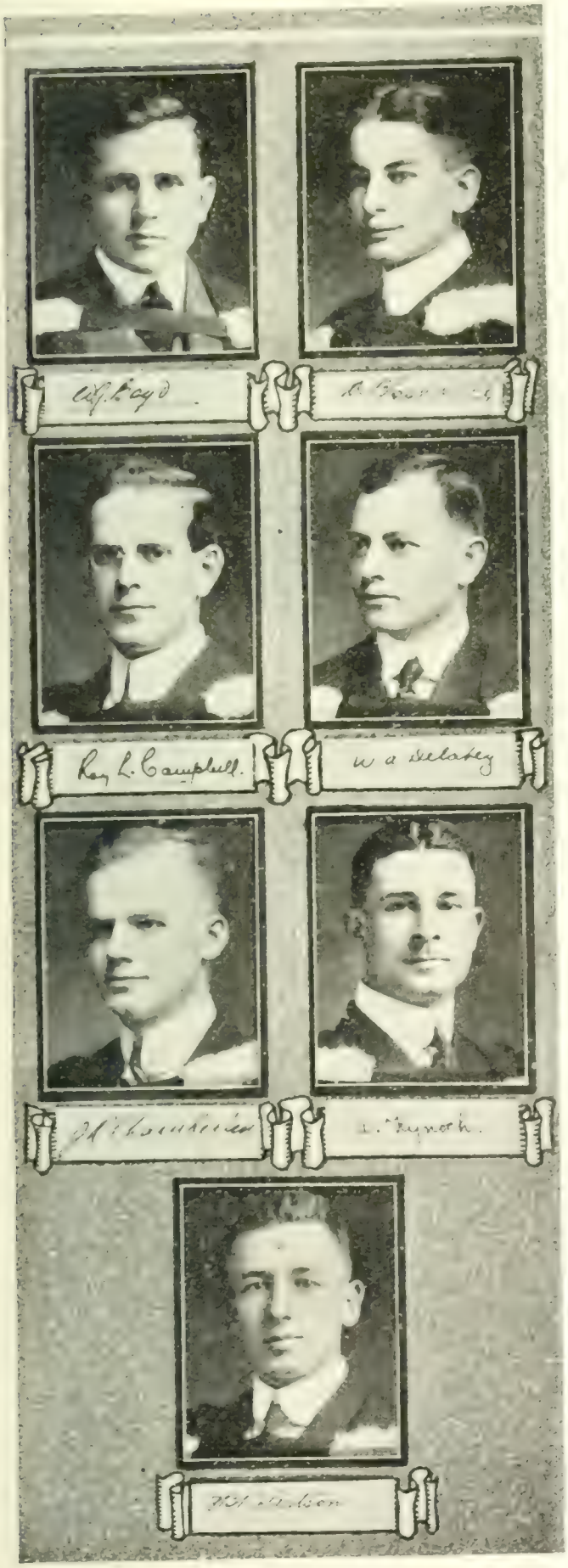
COMPLIMENT BRITISH COLUMBIA.

Many compliments have been received by the Honorable W. R. Ross, Minister of Lands of British Columbia, upon the new Timber Royalty Act, in which the principle of profit-sharing in the timber resource is a feature. Among those who have written warmly commending the new act are: Hon. Clifford Sifton, Chairman of the Canadian Commission of Conservation; Mr. Henry S. Graves, Chief Forester of the United States; Hon. David Houston, United States Secretary of Agriculture, and Dr. B. E. Fernow, Dean Faculty of Forestry of the University, Toronto. At a meeting of Timber License Holders, held in the office of the B. C. Lumber and Shingle Manufacturers' Association, the subject was discussed, and the report states that all present appeared well satisfied with the new act.

The letter of the United States Secretary of Agriculture was as follows: 'The plan of readjusting stumpage values of timber at stated intervals in sales from public lands, whereby the public will derive a fair share of the increase in lumber values, is one with which I am in hearty accord. You will doubtless be interested in learning that a provision of this character is included by this department in all contracts for sales of timber from national forest lands where the period of contract is in excess of five years, and that it has been accepted as equitable by timber operators. I feel that you are to be heartily congratulated on this progressive legislation.'

Dr. Weiss, Director of the United States Forest Laboratory at Madison, Wisconsin, U.S.A., is to go to British Columbia this summer at the request of Hon. W. R. Ross, Minister of Lands, to study the utilization of waste products in lumber manufacturing.

Toronto University Forestry School.



GRADUATING CLASS, 1914.

The graduating class of the Forest School of the University of Toronto for 1914 consists of seven men, which is slightly smaller than for the two years previous. All the men have secured employment and are beginning work forthwith. Of the seven the Dominion Forestry Branch has employed five, namely Messrs. A. B. Connell, W. J. Boyd, W. A. Delahey, Wm. Kynoch and F. B. Robertson. The location of these gentlemen for the present will be seen in the list of changes in the Dominion Forestry Branch on another page. Mr. Roy L. Campbell is to become assistant editor of the *Pulp and Paper Magazine* of Montreal. Mr. J. R. Chamberlain goes to the British Columbia Forest Service, acting as a Forest Assistant in the Kamloops District under Mr. P. Z. Caverhill.

Dr. B. E. Fernow, Dean, Toronto Forestry School.

Hon. W. R. Ross, Minister of Lands for British Columbia, is arranging for the exhibition of finished forest products of British Columbia at all the Trades Commissioner's offices throughout the British Empire. The object is to make British Columbia woods and their good qualities better known in the timber markets of the world.

MAPLE SUGAR MAKERS WIN.

At the annual meeting of the Canadian Forestry Association a resolution was passed supporting the effort of the maple sugar makers to have a law enacted prohibiting the selling of adulterated maple sugar and syrup. The ground taken by the Association was that owing to the lack of remuneration in the business, if adulteration was allowed, farmers would clear of maple trees land that was not fit for anything else and that land would become permanently unproductive. That this was actually taking place is seen from an extract from a letter written by one of the leading bankers of the Eastern Townships of Quebec. He writes: 'In driving around the country I have noticed that not a few maple groves, which used to produce a considerable amount of sugar, have been cut down for fire wood. It seems to me a most foolish thing to do.'

Not only was there adulteration, but sugars and syrups innocent of any maple sap were put up in such a way as to convey the impression that the pure maple product was being sold. The argument of those who sold these adulterated and imitation articles was that they were composed of ingredients not harmful to those who used them as food. After a hard fight, however, the maple sugar makers won their point, and a new law governing this matter, passed at this session of Parliament, prohibits the use of the word 'maple' on any food products bearing a resemblance to maple sugar, or maple syrup, unless the same are produced wholly from sap of the maple tree. Maple sugar and maple syrup in Canada now stand on the same basis as butter and honey. They must be pure, or the seller is liable to a haevy fine.

The production of maple sugar is now valued at a little over $2,000,000 per year, and friends of the industry predict that it will now rise, in a few years, to $7,000,000 or $8,000,000. Maple groves, instead of being cut down, will be protected, and new groves will be developed in wood lots, or even set out again on abandoned, or partly abandoned, farms.

FOREST PRODUCTS OF CANADA, 1912.

The Dominion Forestry Branch has issued Bulletin 42, *Forest Products of Canada*, 1912, by R. G. Lewis, B.Sc.F. This is a collection of bulletins 38, 39 and 40 for convenience and covers the production in Canada in 1912 of lumber, square timber, lath, shingles, pulpwood, poles and railway ties.

Persons interested may receive copies free upon applying to the Director of Forestry, Department of the Interior, Ottawa.

YUKON TIMBER PROTECTION.

A member writing from the Yukon says: 'I know of no other place in Canada where our limited area of timber should be so zealously guarded as in the Yukon. We have many uses for wood here, whereas it is not so necessary in other parts of Canada. We must depend entirely upon it for fuel, and we cannot import timber for mining purposes, as it would be too expensive, and we would have to let low grade mines remain undeveloped. Notwithstanding these facts, our timber land is burnt over and thousands of cords destroyed every year. Most of this destruction could be avoided. The fires mostly occur along the Yukon Valley, on account of people making their way into the interior in small boats. They land on the bank of the river to cook their food. After this is done they return to their boats, leaving the fires to go out or to ignite the nearby woods, just as may happen. This could be stopped by increasing the Mounted Police patrol, and this should be done as early as possible, as we expect large travel to the new gold strikes during 1914.'

LOWER OTTAWA FOREST PROTECTIVE ASSOCIATION.

The organization for protecting in a co-operative way the forests on the Nation, Lievre, Rouge and Gatineau rivers, the formation of which was noted last month, has now been completed. A charter has been obtained from Quebec. The officers are: President, Hon. W. C. Edwards; Vice-President, Mr. Ward C. Hughson; Directors, Messrs. R. M. Kenny, George Millen, and J. B. White; Secretary, Mr. Frank Hawkins; Chief Fire Inspector, Mr. Arthur H. Graham. The Secretary's office is at 19 Castle Building, Ottawa.

Although it was late in the year before the charter was received, the officers immediately set to work and placed a force of about forty men under the Chief Fire Inspector. He immediately proceeded to the woods, where some spring fires were already reported, and though with very little equipment and with no opportunity to cut trails or erect telephone lines, is at present doing what can be done to combat the fires.

OIL FUEL FOR LOCOMOTIVES.

The use of oil fuel for locomotives was begun in the United States in 1900, now oil burning locomotives are operated exclusively upon 20,910 miles of railway in the United States and 587 miles in Canada; and in conjunction with coal burners on an additional 4,720 miles in the United States.

INDIANS AS FIRE RANGERS.

A forest ranger in the west writes, commenting on the suggestion of Archdeacon Renison and others as to making use of Indians as fire rangers. After an experience of nearly thirty years among the Indians, he comes to the conclusion that they will not make good fire rangers. They lack, in his opinion, the steady application of white men, and they are so inter-related to all the Indians of the same district that it is practically impossible to get them to act in the prosecution of another Indian. They are excellent canoe men and woodsmen, and make good assistants to white rangers, who can direct them and press prosecutions for setting fire to the forest.

MAPLE SUGAR MAKING.

The article by Dr. Fisk in the January issue of the *Canadian Forestry Journal*, on the possibilities of a maple sugar grove, attracted a great deal of attention. The comparison which Dr. Fisk made between an apple orchard and a sugar bush was most suggestive.

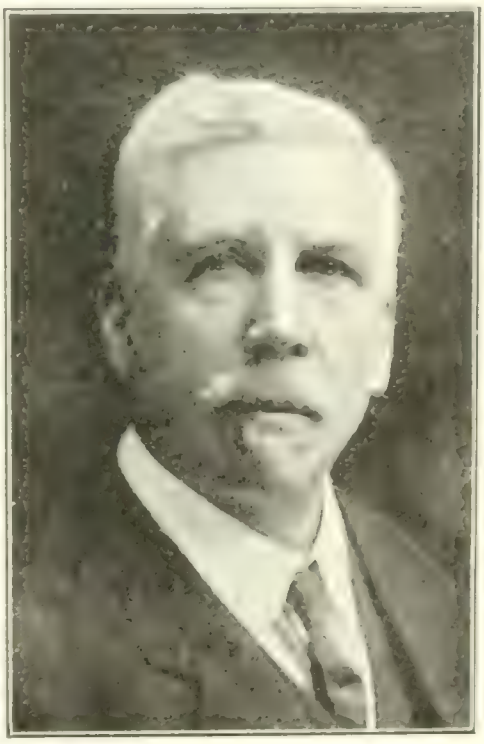
In this connection Hon. J. E. Caron, Minister of Agriculture in the Province of Quebec, deemed the matter of sugar making of so great importance that in the early spring he caused three schools to be opened to teach the best methods of making maple sugar and syrup. These schools were conducted at Beauceville, Beauce Co., St. Roch des Aulnaies, l'Islet Co., and at Labelle, Labelle Co. The results were such that it is believed the schools will be re-opened next year.

CANADA'S GRAVE RESPONSIBILITY.

A member of the Canadian Forestry Association, who is also at the head of a great wood-using industry, writes:

'Canada has a grave responsibility in the matter of its woods and forests, and I am glad to know that this is being realized more and more, but I am satisfied that consistent and intelligent effort has yet to be directed in the matter of reforesting. The fringe of the problem is being skirted, nothing more. To an intelligent onlooker the future supply of pulp wood and pine is a very grave matter, and it is certainly up to the present generation to take care of future generations, and not leave them a heritage denuded of the very raw materials which are so necessary to existence. Our woods are receding, pine is scarcer, there is less of it; our pulp woods are further in the background, and all we say, "Wait and see what nature will do."

'Coupled with intelligent work in the direction of reforesting, it goes without saying, of course, that there should be adequate fire protection all the time, and I was particularly interested in that portion of your letter which told what work has been done in Quebec.'



The Late Sir William Whyte, formerly Vice-President Canadian Pacific Railway and a warm friend of forestry. He presided at the opening of the Winnipeg Convention, 1913.

HE STRUCK A MATCH.

He struck a match as he passed through
The glorious growth of centuries,
He lit his pipe and that he threw
To the dry blaze among the trees.
It flickered, seemed to die away—
And he, all careless, passed along,
Filled with the pleasure of the day,
The glory of the Forest's song.

Furious, wind-driven by the gale
That roared as Hell in thought to roar,
The forest fire swept hill and vale,
Claiming its victims by the score.
Hope-flame-tongued, covered every place
That even seemed to offer hope,
And devastation smote Earth's face:
No power, save God's, with this could cope.

Black are the hills where stood the trees
That graced them so short time ago;
No more their green boughs to the breeze
Sing gently, waving to and fro;
Black are the stumps and dry the rills
That yesterday so joyous went;
But blackest is it that these ills
Are suffered by the innocent!

—*Carroll Wright.*

POWERS OF FOREST RANGERS.

A western forest ranger writes to the *Canadian Forestry Journal* commending Mr. E. H. Finlayson's suggestion at the Winnipeg Convention that rangers be given certain judicial powers. This ranger states that often in the far north much more might be done in checking carelessness in the handling of fire, or violation of forest protection laws. The offender may be caught red-handed miles away from any justice of the peace, and the rangers have no power to take the violator before a justice without a summons, which might take weeks to obtain. He suggests that chief rangers, or assistant chief rangers, should have the powers of justices of the peace.

IS SECOND GROWTH AS GOOD AS THE VIRGIN GROWTH?

Mr. J. D. Howe, of St. John, New Brunswick, writes: 'In the December number of the *Canadian Forestry Journal* the views of the Deputy Minister of Lands and Forests for New Brunswick are given on two papers contributed by Mr. Allen in the issues of October 1st and 15th last of the Canada Lumberman. Lieut. Col. Loggie, the Deputy Minister, after agreeing with Mr. Allen on the disposal of brush, etc., regrets that he cannot agree with his statement, "that after virgin growth is cut away quite as good never follows," and adds, "my theory is in lumbering; remove the merchantable log at maturity; let in the air and light, and the same process will rotate, resulting in a bountiful nature supplying as good a log as the virgin one that was cut away."

'The questions may be asked—How much of the forest does the Deputy Minister regard as virgin? Is it only the matured trees? Does he consider the smaller trees younger and as second growth, and that a bountiful nature will continue to supply as good logs as the first? If so, he is laboring under a delusion that many other high authorities in forest treatment are laboring under; a delusion that is laying waste immense areas once covered with fine forests.

'In differing from such high authorities on this question, I feel the gravity in making these assertions, but as Nature's proofs are so convincing, I take the liberty in doing so.

'If the trees in a close stand of virgin spruce forest be carefully examined (large and small) it will be found that they are nearly all the same age, and should all be considered the virgin forest. It is thought by many that the smaller are younger trees, but examine and be convinced.

'When the largest trees are taken out, letting in the sunlight and air, undoubtedly the smaller will rapidly put on new growth and produce as good logs as the first. This can be repeated or rotated, as it is usually termed, until the first or virgin stand is exhausted. While this process is going on the new or second growth will appear wherever sunlight is allowed to reach the earth by the openings made in removing the virgin growth. This second growth consists chiefly of brush spruce and fir branched to the roots, poplar and other varieties of so-called forest weeds, which give the lumbermen so much trouble, swamping roads (greatly increasing the accumulation of brush) in order to secure the last of the virgin timber.

'No, Mr. Allen's views will be borne out as correct by those who have much to do with lumber getting and using.

'I have dealt more fully with this subject in a paper sent to the Canadian Forestry Convention in February, 1912, of which a review was published in the June, 1913, number of the *Canadian Forestry Journal*.

'This phase of Canadian Forestry is one of most vital importance at the present time, and should be carefully and impartially looked into.'

BUSINESS VISITORS.

Among those who called at the office of the Canadian Forestry Association, in the Journal Building, Ottawa, during the past month, were Mr. R. D. Prettie, Supt. of Forestry for the Canadian Pacific Railway; Mr. H. R. MacMillan, Chief Forester of British Columbia; Mr. E. J. Zavitz, Provincial Forester for Ontario. All of the above are directors of the Association, and Association matters were discussed with the Secretary. Other visitors were: Mr. G. A. B. Krook, Wolseley, Sask., Horticulturist for the Canadian Pacific Railway; Arthur H. Graham, Chief Fire Inspector of the Lower Ottawa Forest Protective Association, and J. H. Grimm, of the Maple Syrup Producers' Association, Montrael.

A FINE HOLIDAY GROUND.

Nova Scotia is just being discovered by Canadians from other Provinces. It is attracting an incraesing number of visitors yearly. Halifax is the centre of attraction, and September is the ideal month. Attend the Convention Sept. 1-4. Help to make it a big success, and see one of the finest parts of Canada.

With the Forest Engineers.

Canadian Society of Forest Engineers.

The President, Dr. B. E. Fernow, has, in pursuance of a provision of the constitution adopted at the last (1914) annual meeting, appointed the following nominating committee to nominate officers for the ensuing year:—Dr. J. F. Clark, and Messrs. J. H. White and T. W. Dwight.

Ottawa Foresters' Club.

The Ottawa Foresters' Club held its concluding meeting for the season at the University Club, Ottawa, on April 8. The President, Mr. R. H. Campbell, Director of Forestry, was in the chair. There was a good attendance of members. The occasion of the gathering was an address by Mr. H. R. MacMillan, Chief Forester of British Columbia, on work in that Province. Mr. MacMillan spoke in an easy, conversational way for over an hour, and then for half an hour more answered the numerous questions submitted by members of the Club, and discussed points brought up. It is intended to have a number of similar meetings during the coming autumn and winter.

British Columbia Society of Foresters.

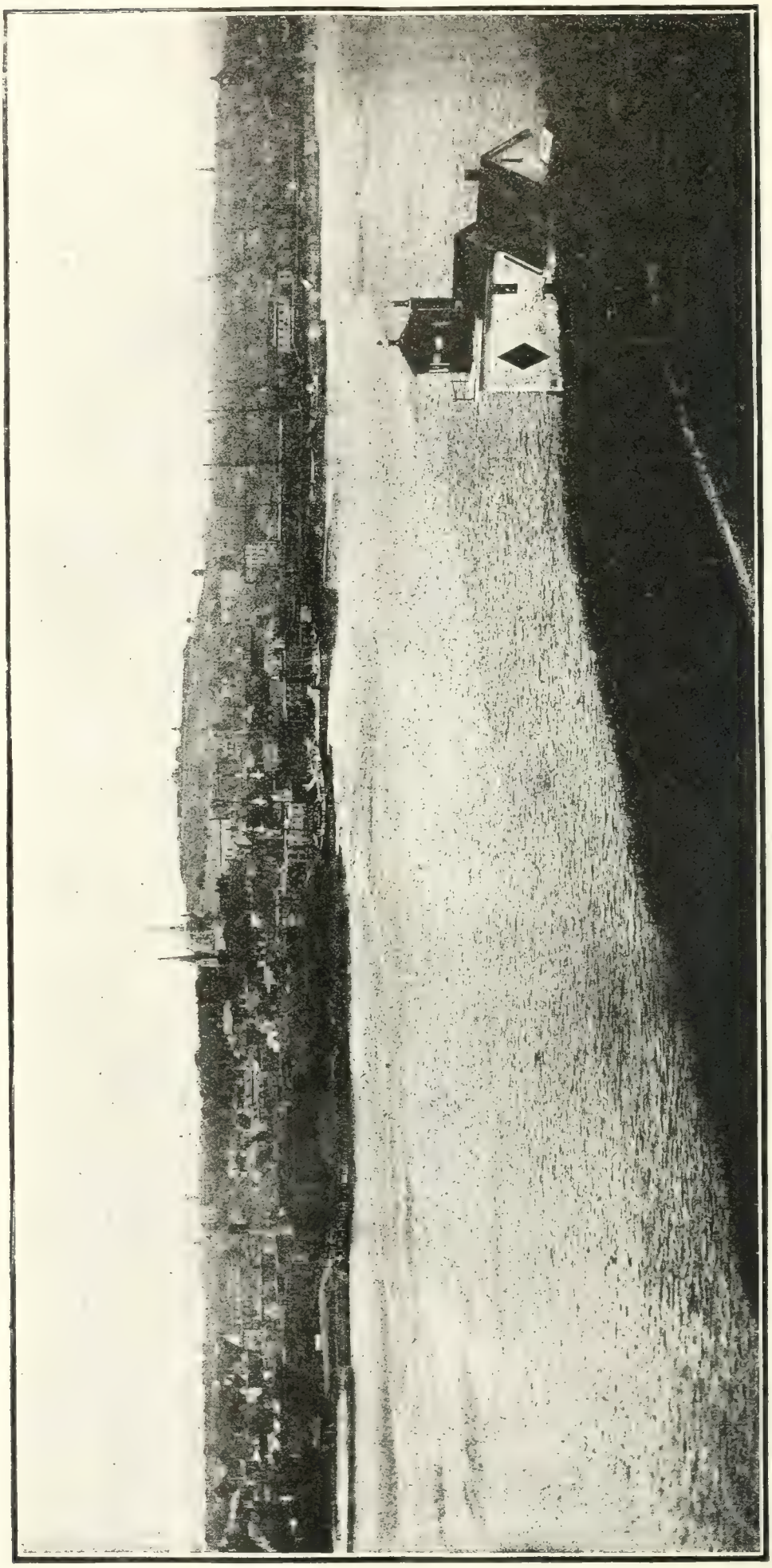
Sixteen members were present at the organization meeting of the British Columbia Society of Foresters, held in Vancouver. Dr. Judson F. Clark was in the chair, and Chief Forester MacMillan explained the object of the meeting. After discussion, Dr. Judson Clark was elected President, and, according to the constitution, he chose the following Executive: Messrs. H. R. MacMillan, D. R. Cameron, G. D. McKay and W. J. VanDusen, the latter to be Secretary-Treasurer. At a subsequent meeting of the Executive a constitution was drawn up, the objects of the Association to be the development of interest in Forestry in British Columbia. Meetings will be held regularly, quarterly, with extra meetings upon call of the President upon special occasions. As the name of the society is not deemed entirely satisfactory in some quarters, this will be further discussed at the next regular meeting.

A new member writes: 'Being so thoroughly in sympathy with the work which you have undertaken, we consider it a privilege to be included in the roster of your Association.'

Sir Douglas Cameron, Lieut.-Governor of Manitoba, one of Canada's leading lumbermen, and a friend of conservation, recently knighted by King George.

The Editor of the *Courier* of Crystal City, Manitoba, writes in an appreciative way of the grove on the farm of Mr. J. J. Ring near that place. He notes that during the winter time driving into this grove out of the storm was like going into a house. He also tells of the other advantages of this grove. These trees were planted by Mr. Ring, the grove being among the first to be set out under the plan of the Dominion Forestry Branch and from seedlings grown at Indian Head. Mr. Ring was one of the earliest members of the Canadian Forestry Association, and is an enthusiast on this subject.

The number of agricultural and forestry colleges and schools in Austria in 1912-13 was 226. These included three colleges, four academies, nine agricultural and five forestry middle schools and eleven lower grade forestry schools.



Halifax, the City of the Convention, Sept 1-4, 1914—View of Halifax from George's Island, showing part of the water-front in foreground and citadel on the skyline. An ideal city for a summer visit.

CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association is the organization in Canada for the propagation of the principles of forest conservation. This it does by means of conventions, meetings, lectures and literature.

It is a popular organization supported by the fees of members, assisted by some government grants.

There is a vast field of work before the Association which is only limited by the funds at the disposal of the Association.

Those who are not already members are invited to join and assist in the work. The membership fee is one dollar per year, and this entitles the member to attend and vote at all meetings and to receive the Annual Report and the *Canadian Forestry Journal*. Women as well as men are eligible for membership.

Applications for membership and requests for literature and information may be addressed to

The Secretary,
Canadian Forestry Association,
Journal Building, Ottawa, Can.

OBJECTS OF THE ASSOCIATION.

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains and on streets and highways.

(5) Reforestation where advisable.

(6) The collection and dissemination of information bearing on the forestry problem in general.

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Canadian Forestry Journal

VOL. X. OTTAWA, CANADA, JUNE-JULY, 1914 NOS. 6 & 7

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Prince Edward Island:—Hon. J. A. Matheson.
Saskatchewan:—His Honor G. W. Brown.
Alberta:—Hon. A. L. Sifton.
British Columbia:—Hon. W. R. Ross.
Yukon:—Hon. Geo. Black, Commissioner.
Mackenzie:—F. D. Wilson.
Patricia:—His Honor Sir Douglas Cameron.
Ungava:—His Grace Mgr. Bruchesi, Archbishop of Montreal.

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HALIFAX CONVENTION INDEFINITELY POSTPONED

Owing to the disturbed situation caused by the war, it has been decided by the President and Directors of the Canadian Forestry Association to cancel the arrangements for the Forestry Convention, which was to be held in Halifax, Nova Scotia, Sept. 1 to 4, and to postpone the meeting till further notice.

Two things among others are necessary to the success of a forestry convention. One is the attendance of a large number of delegates, and the other is the reading of the reports of the papers and discussions by the people who are not able to attend.

It was felt that it would be impossible to secure either of these factors under conditions bound to prevail for some time in Canada.

Members are urged to take note of this change and to let it be known that all railway arrangements for the Convention are now cancelled, and that anyone going to Halifax on

FACULTY OF FORESTRY
SEP 14 1914

the dates previously advertised with the expectation of being a delegate will have to pay full return fare.

In the meantime, it may be said that much of the work done in preparation for the Convention, such as the Secretary's lecture trip and distribution of literature, will not be lost, and also that whatever is done in regard to this or other future meetings the members and the public will be duly notified.

Meetings in Nova Scotia.

Carrying out a plan formed last winter, a series of meetings was held throughout Nova Scotia to explain the objects of the Convention. At these meetings addresses illustrated by stereopticon views were delivered on forest conservation, particularly as it affects Nova Scotia. At the close of each meeting discussion was invited upon the subject.

While the convention is not now to be held as originally planned, much information was spread throughout the province and much interest aroused which will bear fruit later.

The Secretary devoted from June 18 to July 18 to this work. He first visited Prince Edward Island and interviewed the Premier, Hon. J. A. Matheson, and Hon. M. McKinnon, Minister of Argiculture, in regard to the representation of the Province at the Convention. The first lecture was delivered at New Glasgow, and the others, in order, were held at Sydney, Antigonish, Liverpool, Shelburne, Yarmouth, Weymouth, Bear River, Annapolis, Middleton, Bridgewater and Kentville. A second visit was also made to Liverpool to address the Annual Meeting of the Licensed Guides of Nova Scotia. A brief visit was also paid to Windsor.

In Halifax the Secretary, along with Mr. F. C. Whitman, Vice-President, consulted Hon. G. H. Murray, Prime Minister of Nova Scotia; Hon. O. T. Daniels, Commissioner of Lands, and other members of the Government, and met a number of prominent citizens.

During most of this trip the Secretary was assisted by Mr. B. R. Morton, B. Sc., F. of the Dominion Forestry Branch, who is conducting an investigation into certain forest features of Nova Scotia. Mr. J. B. Whitman, Deputy Commissioner of Crown Lands for Nova Scotia, was also present at several of the meetings.

On his way to and from Nova Scotia, the Secretary was in consultation with the President, Mr. William Power, M.P., at Quebec, and throughout the trip he was in constant touch with Mr. F. C. Whitman, of Annapolis Royal, who drew up the plan of the meetings and assisted in every possible way.

The meetings were of particular interest in the lumbering districts, and the newspapers throughout the Province gave very full reports. The discussions showed that the owners of wood lots are becoming alive to the necessity of properly cutting their timber in order to keep up a continual supply from their lots.

New Head of Forest Laboratories.

Mr. John S. Bates has been appointed Superintendent of the Dominion Forest Products Laboratories in connection with McGill University, to take the place of Mr. A. G. McIntyre, who resigned to take charge of a new paper mill at Bathurst, New Brunswick.

Mr. Bates was born at Woodstock, Ont., and is a graduate of Acadia University in arts and science. After leaving Acadia he went to Columbia University, New York, and graduated in chemical engineering, specializing in pulp and paper. He made a study of the utilization of Southern pine waste while at Columbia, and since the conclusion of a brilliant course there has had practical experience with the Union Bag and Paper Co., of New York, and Arthur D. L. Little, Inc., chemists, of Boston. Mr. Bates has begun his new duties with the most favorable prospects.

The Late Overton Price.

Foresters [illegible] throughout America learnt with very deep regret of the recent lamentable death of Mr. Overton W. Price. Mr. Price, while only thirty-nine years old at the time of his death, had been connected with forestry work for about twenty years, and his reputation was international. During Dr. Gifford Pinchot's term as United States Forester, Mr. Price was his assistant. He resigned shortly after Dr. Pinchot left the service, and since that had been practising as a consulting forester. He was also Vice-President of the National Conservation Association. He visited Canada on many occasions, and at the time of his death was consulting forester to British Columbia. Mr. H. R. McMillan, Chief Forester of British Columbia, sends the following appreciative note on Mr. Price's work:—

'Canadian forestry will long feel the loss of Overton W. Price. Mr. Price's first services to Canadian conservation were indirect. Under his influence, working in association with Mr. Pinchot, the educational effect of the United States Forest Service knew no international boundary.

'The crystallization of forest sentiment in Canada, the springing into life of Canadian forest organizations can be traced directly to the international forest leaders of the United States, of whom Mr. Price was one.

'Mr. Price's direct services to Canadian forestry began in 1906 when, as representative of the United States Forest Service, he attended the Canadian Forestry Association Convention in Vancouver. His greatest service to Canada was rendered while acting as consulting forester to the Province of British Columbia during the two and a half years previous to his death.

'The Royal Commission on Forestry, with Mr. M. Allerdale Grainger as secretary, had shown the necessity for a Provincial Forest Service, and had outlined an organization, but the work from the ground up remained to be done. The credit of the organization belongs to Mr. Price. His breadth of vision conceived it, his zeal carried it through, his counsel guided it, his standards are and will be its inspiration. His memory will live long with foresters in British Columbia.'

Strength of Hickory.

Hickory is the strongest Canadian wood. When properly seasoned a hickory column will support a weight of twelve tons per square inch cross-section, which is considerably more than what could be borne by a pillar of cast iron or steel of the same length and weight.

Forest Fires.

[illegible] reports the worst season for forest fires since an organized attempt has been made [illegible] In some parts the snowfall was unusually light. It was hoped that copious spring rains would make up for this, but, on the contrary, spring opened very dry and cold, with the result that by the middle of June vegetation was scarcely more advanced than ordinarily it is in the early part of May. The result was that the very dangerous period extended at least a whole month longer than usual. More effort to discover and fight fire was put forth than ever before, with the result that in spite of the bad season losses were kept down much below what was feared. Such a season as this indicates that under ordinary conditions thorough organization of the fire fighting forces can almost completely eliminate forest fires.

Protect Young Timber.

Mr. Clyde Leavitt, chief fire inspector of the Railway Commission, stated, in an interview, that the railways were doing everything in their power to prevent bush fires near the railway tracks from spreading. 'It seems to me,' said Mr. Leavitt, 'that there is too little attention paid to the fires in the cut over areas, and too much protection concentrated on the merchantable timber limits. If more effort were devoted to protecting the young timber it would give it a chance and prevent the fire from spreading to the limits where the trees are large enough for merchantable use.'

MAKE IT KNOWN.

Many people first have their attention directed to forest conservation by conventions. They join the Association just before or at the Convention, and consequently the literature sent out to those already members may not reach them. Members are, therefore, requested to make known to any who may be interested the fact that the Halifax Convention, Sept. 1 to 4, has been postponed indefinitely, and that all railway and other arrangements are cancelled.

Prince Edward County Sand Dunes.

One of the noted features of Prince Edward County, Ontario, is the five mile stretch of sand dunes which lie between Lake Ontario and West Lake. These dunes lie along the Lake Ontario shore in undulating hills some of which rise to the height of 150 feet.

For years past they have formed a great attraction to the tourist, but the nearby farmers, while just as much interested are not as enthusiastic. The fact is that these shifting hills of sand constantly moving under the action of the wind, are a menace to agriculture.

Like all other sand areas the evil is that they will not stay in their original position, but are constantly advancing on the fertile lands causing serious loss. Even the summer resort feature which would seem to be a permanent industry on the dunes suffers from the shifting character of their snowlike particles. One summer hotel has already been moved twice, and another was recently sold for a rediculously small price because the three acres of fertile land on which it originally stood has been completely covered by a spur of one of these hills.

Reforestation would doubtless fix the sand and turn what is now a menace into a profit producing and beautiful area. It has been done in France and other countries, and all that seems to be necessary is that it be undertaken on a sufficiently large scale. It is to be hoped that when we have had more experience in dealing with sand lands in Ontario and Quebec the work of reforesting this part of Ontario will not be long delayed.

Evergreen House, Which Has Been Moved on Account of Sand Encroachment.

Sand Dunes 150 Feet High—Looking towards West Lake, with Lake Ontario in the background.

Tobogganing on the Sand Dunes.

Queensland Forests.

The annual report of Mr. N. W. Jolly, Director of Forests for Queensland, Australia, shows that there, as elsewhere, the amount of timber in the forests has been much over-estimated. There are now in temporary reserves 3,211,855 acres, so held until they can be examined to ascertain whether the land should be permanently reserved for forest growth. The total area permanently reserved in state forests and national parks is 881,682 acres. During the year 98,950 acres of the temporary timber reserves were examined, and of this 7,600 were found unsuited to the growth of indigenous timbers. About 30,000 acres was entirely cut over and offered little inducement to reforestry efforts. Another area of 15,150 acres was estimated to carry 40,000,000 superficial feet of hardwood, of which 30 per cent. was fit for milling purposes. Of the remainder 30,000 acres contained pine and 14,500 were grasslands, the retention of which was necessary in order to provide grass for teams engaged in hauling. The remaining 26,000 acres was estimated to contain 170,000,000 feet of timber of milling size, with probably 50 per cent. more of knotty unsalable timber and considerable young growth. The timber revenue for the year was $317,230, and the expenditure $26,980. A nursery has been started in which to propagate suitable indigenous and exotic trees. Efforts are also being made to secure better utilization of pine tops. A pulp company to utilize pine waste has also been started.

A member in the United States writes: 'The *Journal* is very interesting. It is snappy and alive. I am sure we will continue the subscription.'

Professor Wallace P. Cohoe of Toronto University has invented a sausage casing which is made from wood pulp.

A Saskatchewan View.

Saskatchewan requires more Forestry Farms. Then there should be at least two lecturers continuously on the road to hold meetings, giving lectures on forestry, shelter-belts, etc. The gospel of tree-planting should be brought to farmers. These lecturers could take the names and locations of farmers who are anxious and ready to plant trees, send in the lists to the head office in the province, and inspectors should be sent out to examine each farm, so as to advise farmers where to plant, and how to prepare the ground for the following year's planting. It is all right to expend money on the general Conservation Commission to enthuse citizens the Dominion over on what our natural resources are and how they should be conserved, but the practical working end of the problem should not be neglected. Give Saskatchewan forestry farms and practical men to meet progressive farmers, and in a few years the treeless, windswept prairies would be changed to a park-like country, with trees on every farm.—*Saskatchewan Farmer.*

Pennsylvania Forests.

Pennsylvania is not only doing a good deal in the way of forestry, but it is letting the people know it by means of leaflets and circulars.

The state, beginning in 1897, bought back 984,064 acres of non-agricultural lands for $2,221,993, an average of $2.26 per acre. This is the state forest.

The state now employs 56 foresters and 92 rangers.

Over 3,000 miles of trails and 75 miles of telephone line have been built. Fire observation towers have been constructed.

Improvement cuttings are being made.

Three large forest tree nurseries and 16 small ones have been started.

HON. W. J. ROCHE, MINISTER OF THE INTERIOR.

All federal forests in Canada come under the Department of the Interior. Hon. Dr. Roche takes a keen personal interest in forestry work. He recently accepted the office of Director in the Canadian Forestry Association.

Over 8,500,000 forest tree seedlings have been planted on more than 4,000 acres.

The forests are now being used as sanatoria.

Campers, hunters and fishermen are invited upon State land.

State Forests afford employment where work is scarce.

Cities and towns are supplied with pure water from these protected forests.

The flow and purity of streams which head within them are regulated and conserved.

By recent enactments the Department of Forestry is permitted to enter into co-operative agreements with local forest fire associations, and also to designate certain of the foresters in the state service to be known as District Foresters, who shall aid farm and woodlot owners in the management of their woodlots, report on fire protection, and take general charge of the forest work in the district.

STUDYING EUROPEAN FORESTS

Mr. R. H. Campbell, Dominion Director of Forestry, Department of the Interior, Ottawa, is at present on a trip to Europe, where he is inspecting forestry methods.

Lookout Towers.

At a cost of only $50 the Dominion Forestry Branch recently erected a lookout tower fifty feet high, overlooking two hundred square miles of woodland. Similar towers are being built on all the Dominion forest reserves in the West in order that fires may be seen and extinguished before they have time to spread beyond control.

Forest fires in the United States have caused an average annual loss of 70 human lives and the destruction of 25 million dollars worth of timber.

Juniper from the Indian reservations of New Mexico and Arizona may prove an excellent source of material for lead pencils. Manufacturers are searching the world for pencil woods.

Modern Co-Operative Forest Protection—Mr. Henry Sorgius, Manager of St. Maurice Fire Protective Association on an inspection trip. This shows method of patrolling rivers and lakes by canoe.

Another Protection Association.

On June 4 a meeting was held in Montreal to consider the question of the formation of a forest fire protection association by the representatives of a number of camping and summer cottage associations. By request the gathering was addressed by Mr. Ellwood Wilson, Vice-President of the St. Maurice Valley Fire Protection Association and the Secretary of the Canadian Forestry Association. The territory lies north and west of Montreal, embracing the Lake Manitou, Trembling Mountain and Mt. Laurier District. A committee was formed to deal with the matter, of which Mr. R. A. Outhet, 54 Beaver Hall Hill, Montreal, is Chairman, and Mr. A. R. Whitall, 734 Mullins street, Montreal, Secretary. As this territory lies between the St. Maurice Valley and the eastern edge of the Lower Ottawa Forest Protection Association territory, it is possible that a new association will be formed here, so that the whole area between Three Rivers and the Gatineau will be covered by fire protection associations.

Lumbering is the greatest American manufacturing industry and is exceeded only by agriculture in supplying the essentials of life.

Are Associations Necessary?

A gentleman writes: 'In regard to the plan of improving forest conditions by propaganda carried on by an indepndent organization like the Canadian Forestry Association.' He says: 'Instead of the individual subscription, helping to make the Hurrah, should not the Government take up the burden? Is it not a most important matter to the Government? Have they not in the past been lax in control, and have they not reaped all the revenues from the forests? and when improvements are made by reforestry will not they reap the benefit?'

This is a question frequently asked. Doubtless if our conditions were ideal and all citizens took a keen interest in public affairs, and governments were truly representative of this intelligent activity, there would be no need of independent societies like the Canadian Forestry Association. But as it is, those citizens who really care about forests or mines or any other national asset are at present, probably, in the minority. In this case it is the minority who urge reforms for the good of the whole country. Gradually the public is becoming aroused, and when it is thoroughly awake then organizations like the Canadian Forestry Association can disband, but until then they are a necessity and the larger and more

vigorous they are the more rapid will the process of awakening be. Government departments are accomplishing a great deal, but they can never carry on an educational propaganda like an independent organization and that is the field of our Association.

Besides this it is a very short-sighted view which sees only increase in government revenues in improved forest management. The governments gain, but the general public gains ten times as much in increased trade, in improved farming conditions, in safeguarded waterpowers and navigation, and in increased rail and steamship traffic. Timber is a heavy bulky raw material, and before it is worked up for the use of man and transported to where he desires to use it much labor must be expended, the results of which benefit the whole community.

Wedding Bells.

On June 30th, Mr. A. G. McIntyre, former superintendent of the Dominion Forest Products Laboratories and Editor of the Pulp and Paper Magazine, now manager of the pulp mill of the Bathurst Lumber Co., at Bathurst, N.B., was united in marriage to Miss Josephine Clarke, daughter of Mr. and Mrs. W. G. Clarke, of Bear River, N.S. The wedding was solemnized in the Baptist church at Bear River, by Rev. W. E. McIntyre, father of the groom. Mr. and Mrs. McIntyre have taken up their residence at Bathurst. The many friends of both the contracting parties, who are widely known in forestry and lumbering circles, will wish them every happiness.

Modern Co-Operative Forest Protection—Rangers of the St. Maurice Valley Forest Protective Association patrolling the railway line on a gasoline speeder following a railway train.

Conservation—What It Is Not!

A common popular misconception with regard to conservation is that it consists in merely saving or hoarding natural wealth for the use of future generations. Nothing could be further from the truth. Mere hoarding is not conservative; it is almost as wasteful as reckless destruction. Wise statesmanship regards our natural resources as so much capital of which the State is the trustee. The community is entitled to the interest, but the principal should be conserved for all time. An exception to this rule must be made in the case of minerals, such as coal, of which there is only a limited supply, that, when once used, can never be restored. But in the case of our forests, our lands, our seas and our wild animal life, the existing supply of timber, of soil fertility, of fish and of fur-bearers, should never diminish, but should rather increase.

Montreal Witness.

Yukon Timber Protection.

A member writing from the Yukon says, 'I know of no other place in Canada where our limited area of timber should be so zealously guarded as in the Yukon. We have many uses for wood here, whereas it is not so necessary in other parts of Canada. We must depend entirely upon it for fuel, and we cannot import timber for mining purposes as it would be too expensive and we would have to let low grade mines remain undeveloped. Notwithstanding these facts, our timber land is burnt over and thousands of cords destroyed every year. Most of this destruction could be avoided. The fires mostly occur along the Yukon valley on account of people making their way into the interior in small boats. They land on the bank of the river to cook their food. After this is done they return to their boats, leaving the fires to go out or to ignite the nearby woods just as may happen. This could be stopped by increasing the Mounted Police patrol, and this should be done as early as possible, as we expect large travel to the new gold strikes during 1914.'

Ontario Beaver Thrive in Minnesota.

There are now about four hundred beaver in Itasca State Park in Minnesota. These are all descended from one male and two females sent from Algonquin National Park, Ontario, in the spring of 1902. The beaver were sent to the Governor of Minnesota by the Prime Minister of Ontario. Five beaver were sent, but two died on the way from Ontario to Minnesota. Within twelve years the descendants of these animals have spread themselves all over the west side of Itasca Park, an area of about twenty-five square miles.

Reasons for Growing Trees.

Trees retard wind.
Trees prevent drifting of soil.
Trees lessen evaporation.
Trees hold snow.
Trees increase yield.
Trees lessen the effect of hot wind.
Trees make a home for birds that eat harmful insects.
Trees furnish fuel and fence posts.
Trees make a place home-like and shelter stock, garden and fruit trees.
When clean-cultivated trees will do well. If left to fight weeds and grass they are quite apt to fail.—*H. A. Bereman.*

The Summer Camp.

A joyous time in wood and copse,
To wnader free from morn till night;
O'er grassy vales and mountain tops,
And back to camp, a welcome sight:
With the purling brook hard by.

The forest bids with open arms,
To nature seekers one and all;
Partake in full of all her charms,
So rich in life that ne'er can pall:
And the bubbling brook hard by.

Does not a scene so bright and free,
Bespeak a meed of thought and care;
A constant call to you and me,
To breed no devastation there:
With the sparkling brook hard by?

A careless fire, the smoker's match,
The growth of centuries is doomed;
With sick'ning haste the giants catch,
The pleasing view's for aye entombed:
And the brooklet now is dry.

* * *

We have a duty, sacred trust,
The young and old, the small and great;
For each one may, he can, he must,
Protect our woods from such a fate:
And the babbling brook hard by.

—*R. F. Child, Victoria, June* 15, 1914.

CO-OPERATIVE FOREST FIRE PROTECTION.

A bulletin (No. 42) has just been issued by the Dominion Forestry Branch on *Co-operative Forest Fire Protection,* by G. E. Bothwell, B.Sc.F.

This bulletin explains the method of forest fire protection pursued by the co-operative association of timber owners, with special reference to the work of the St. Maurice Valley Forest Protective Association. It gives the principles of the organization, the cost to the timber owners, the assistance given by the Provincial authorities, the methods used to combat fires by constructing trails, telephone lines, and lookout towers, and the equipment used by patrolmen and fire fighters.

Copies of this bulletin may be had free by those interested upon applying to the Director of Forestry, Department of the Interior, Ottawa.

The labouring men should support forestry because seven-tenths of the products of the forests go to the men engaged in logging and lumbering.

Modern Forest Protection—Ranger of the Dominion Forestry Branch looking over the country from a lookout tower. He will report conditions to headquarters by telephone, the station being located at the foot of the tower.

The Reforestation of Sand Lands.

Mr. R. F. Davy, Assistant Engineer, Dept. of Public Works, Timiskaming, Que., writes: 'The reforestation of sand lands is a timely subject, and it naturally follows how best to achieve this result. Questions will arise as to which is the most suitable timber to grow; whether to sow seed or plant saplings; the cost per acre; amount of labor required and proper season in which to do the work. Again what benefits are to be derived, also, will these benefits be immediate or in the far distant future. Will the reforestation of sand plain in the backward counties of Ontario, for example, ever be of benefit.

'Those best informed know there are many townships, and even counties, that are really barren and unfit for habitation, and are unable to support a population even in poverty. Some will use the argument that every tree planted will assist to maintain a more uniform flow in rivers than when areas are devoid of timber. Even admitting this argument, do we not see something more tangible ahead of us. A child will in 90 per cent. of circumstances support itself and be of assistance to the community at the age of twenty-one; a tree likewise planted by seed or sapling will support itself and likewise be productive from twenty-one years of growth. It will be of value commercially speaking, and from the same area an everlasting growth of timber can be maintained, reaching a maximum value at the end of 100 years. More figuratively speaking, an acre of small trees at the age of, say 21 years, will be worth $15.00; at 30 years, $75.00; at 60 years, $200.00; and at 100 years, $1,000.00.

'The above figures would vary with the species of timber and the demand, and are used only as an argument. To my mind this work should not fall upon the individual but upon the Government.'

What is Forestry?

(So much interest has been expressed in the Circular recently issued by the Association entitled 'What is Forestry?' that it is here reproduced.)

What Is Forestry?

Forestry is the science and art of making the best permanent use of the forest.

For What Purpose?

To increase the wealth and comfort of man. It seeks to preserve forests only in so far as these may minister to man's well being.

Does It Demand That No Trees Be Cut?

No. It aims to have every acre of land in the country put to its highest use: Wheat land to wheat, pasture land to pasture; pineland to pine; spruce land to spruce, and so on. It would clear farming lands as soon as that may be done profitably, but it urges that absolute forest land be so cut over that a new and bettter crop of trees will take the place of the virgin crop.

What Is Absolute Forest Land?

Land that will never grow anything profitably but trees.

What Interest Has Canada in Forestry?

Over half the soil of habitable Canada is fit only to grow trees.

Is Not Lumber Going Out of Use?

On the contrary, in spite of concrete, steel and other substitutes, more lumber is being used today the world over than ever before. The price of timber is constantly rising. Nearly all the countries of the world are importing timber. Canada is one of the very few timber-exporting countries. In her large forest area Canada has a resource which should go on increasing in value every year.

Would Forest Preservation Kill Lumbering?

No. Forestry does not prohibit the cutting of ripe trees any more than agriculture forbids the cutting of ripe wheat. It simply asks that cutting on non-agricultural lands be done in such a way that a new and better crop will come on. It also asks that timber areas be protected from fire and from injurious insects, so as to save both the mature trees and the young forest, the hope of the future. It looks to making lumbering (timber harvesting) just as permanent a business as farming.

Would Not Forests Crowd Out Farms?

No. All the land that the forester asks for permanent forests is land unfit for farming—too poor, too hilly, too stony. The attempt to farm this land results in poverty, abandoned farms, man-made deserts. On the other hand, the maintenance of forests on such lands means a distinct gain to agriculture, especially in regard to moisture conditions, wood supply, wind-breaks, covers for insectivorous birds and evenness of stream flow. Every interest in the country, in fact, is benefited and none injured by retaining forests on non-agricultural lands.

Is Forestry Worth While?

It is. The value of forest products in Canada in their first stage of manufacture (in the sawmill yard) is estimated by the Dominion Forestry Branch at $170,000,000 per year. This timber is at the base of all our manufacturing. It forms a great proportion of our transportation business, and the maintenance of forests on the uplands keep our streams in even flow, thus preserving our water supplies and water powers. Forests are also great health resorts and game preserves.

Have We Not Plenty of Timber?

We used to think so, but now we know that a few decades will see the remainder of our virgin timber cut. Some authorities think the United States will have exhausted their virgin timber by 1930 or 1935. Then, if they should come to Canada to get their supply, our authorities tell us our timber would last seven years.

What Can Be Done?

The first thing to do is to stop forest fires which consume at a dead loss seven or eight times as much timber as the axe of the lumberman. The great factor in this is the educating of public opinion. When the public is aroused forest fires will stop. Much can be done by disposing of the debris left after lumbering, by screening smokestacks of locomotives, regulating times of settlers' brush-burning, and by patrolling timber lands to reduce the danger from tourists, campers, prospectors and from lightning. When forests are protected, then will come methods of reforestation.

Does Anybody Care?

Many care, but not all. Last year the different governments in Canada spent considerably over one million dollars in forest protection and administration, chiefly in fire protection. Lumbering and railway companies and private individuals spent half a million more. This included trail and telephone-line building and the introduction of oil-burning locomotives on some railways.

How Can I Help?

One of the most efficient methods is by joining the Canadian Forestry Association. This is the national organization which has for its object the awakening of the public to the need and value of forest protection. In numbers there is strength, and those who believe in forest conservation have, by banding together, done much more in getting governments, corporations and private individuals to adopt better methods than they ever could have done by separate effort. The work of the Association, which is constantly growing, has been endorsed by leading public men. Joining the Association will keep you informed of what is being done and show you how you can help. The membership fee is the nominal one of One Dollar per year, and this entitles members to receive, without further charge, the *Canadian Forestry Journal* (monthly) the report of the addresses, papers and discussions at the Annual Convention, and other publications issued from time to time. If you are already a member you can assist by sending in the names of those who may be interested.

Timely Reminders.

The British Columbia Forest Branch is not only endeavouring to prevent and fight forest fires but it has entered upon the work of educating the public to help in fire prevention. The Branch has distributed a picture, a copy of a painting entitled 'Putting Out the Camp Fire.' These pictures are being distributed chiefly among school children of the Province, but also to country hotels and banks, sawmills and logging camps, post offices, stopping places, stores, government buildings, steamships, etc.

The Branch has also issued a pocket whetstone bearing on the back the following:—

WHEN YOU ARE IN THE WOODS
Keep Your Axe and Knife Sharp
and
BE CAREFUL
Not to Start
FOREST FIRES.

Presented by the Forest Branch Dept. of Lands, Victoria, B.C.

The pocket whetstones were distributed among men of the woods of all kinds, as loggers, hunters, fishermen, surveyors, prospectors, settlers, rural mail carriers, and cruisers.

[illegible] to newspaper editors and to clergymen. Altogether [illegible] pamphlets, pictures, whetstones, and circular letters were distributed throughout the province. In most cases explanatory letters accompanied the articles to the sundry recipients.

It is confidently expected that the character of the material and the method of its disposal will impress in a forcible manner on the public the importance of care with fire in the woods.

Bears Worse Than Mice.

Mr. David Gillies, of Carleton Place, the well known lumberman, received an amusing letter from one of his old fire rangers on the Upper Petawawa a short time ago. For people who are afraid of bears, it affords an interesting insight into the contempt entertained for these 'varmints' by the real backwoodsman. The ranger writes to Mr. Gillies as follows:—

'Bears are a little troblesome this month. They have broken into the hut at Catfish several times during my absence, and have eaten my provisions and upset everything. I had the window nailed up with inch boards and five-inch spikes, and they tore that off and got in again. They come at night, too, and waken me up. I struck one in the face one night as he was trying to climb in the window, and I scared another away when he started to pull down the barricade. The park men told me I should get a heavy revolver. I am not afraid of bears, but they are more troublesome than the mice and squirrels.'—*Rod and Gun.*

Minnesota State Forests.

Next November the electors of Minnesota will vote on an amendment to the constitution. The state has fifteen million acres of land unsold, and under present laws this must be sold for agricultural purposes. The object of the amendment is to have such of these lands as are unfit for farming turned into a state forest and managed on modern forestry lines. The Minnesota Forestry Association has inaugurated a campaign in favor of the amendment. It is stated that most of these lands are absolute forest lands, and if attempts are made to farm them they will become desert like much of the land that has already been stripped of timber in the state.

Forests and Mines

A. Lakes, Ymir, B.C.

The only redeeming features of the great forest fires in a mining way are, that after them if the plant has survived, there is less danger of another fire and the burning off of timber and brush makes the following of leads on the surface and prospecting more easy. But these compensations are incomparable with the irreparable loss of necessary timber and the protection the growing timber affords against the miner's worst enemy, the snowslide.

The burning off of the country has a pernicious influence on the storage and equable dstiribution of water necessary for all kinds of mining. The baring of a mountan-itop and its denudation of soil, trees and bushes, causes the water it receives to gather so quickly that it will discharge in torrents into the river below, washing out flumes and filling reservoirs with silt and gravel, whilst forests growing on mountain summits and protecting water-sheds, not only collect and retain the moisture and snow, but let the water out gradually and advantageously in the season when most needed.

The rapid thawing in spring of a great fall of snow accumulated during the winter, so far from being advantageous to the mines, and especially the placer mines, and supplying them with an abundance of water, may be detrimental, and often after destroying flumes leaves the area dry and waterless or nearly so.

The writer who has passed some winters in the mountains of British Columbia near Nelson, has had ample opportunity of noting the influence of forest fires in originating and promoting snow slides and of standing timber in preventing and arresting them. Snow slides great and small are very common on either slope of Wild-Horse Creek. The entire valley has more than once been swept by forest fires, leaving patches of timber here and there, usually a thousand feet or more above the river, that next to the river having been burnt out. Above this standing timber some high peaks rise for another thousand feet. Snow slides abound on the latter but rarely reach the valley, being arrested by the standing timber in the intermediate zone. Nearly all the slides of a damaging nature to mining works, start from bare places immediately below the timber but not from within it, although snow there lies deep. In a recent wide slide that skimmed off the snowy crust of a hill for a width of half a mile and a downward length of 1,000 feet, it was noticeable that when the great sheet started it broke off invariably at points just below the standing timber in an irregular line. The great sheet left this line of parting in a well-defined bench five to ten feet high all along the hill side resembling an irregular brush fence and rolled down into the valley and river in a mass of foaming snow. On the opposite mountain our mine has ben troubled by small slides rolling down from the timber above. These would at times block the entrance to the tunnel and separate it from the blacksmith shop. Larger slides in an adjacent gulch frequently disturbed our pipe line supplying power to the compresser. Sections of flumes were carried away causing power to be shut off for a day or more. The difference such annoyances made in mining was shown in the drilling returns and progress of the tunnel. During the summer months the average cost was about $12 per foot. In March (the worst snow-slide month) it was $30.00. Many small slides descending from the slopes on either side obstructed our wagon-road to town and train for mail and supplies. These slides had to be dug through for the passage of teams and sleighs. Winter expenses due largely to snow slides, directly or indirectly are usually far in excess to those of the summer months. The existence of these slides is almost entirely due to the burning off of the timber. Before the great fires, slides were few and confined to well-known gulches. Since the fire they have appeared in every direction as much on the open face of the hills as in the gulches. Sometimes the whole snow face of a hill will slide off bodily, in other cases, the slopes are literally channelled by them and at times there is an epidemic in which the hills are said to 'rain slides' only a few yards apart. From our cabin window you can count thirty slides within the space of a mile. Whilst the burning off of timber has removed further fear of fire to the camp and has exposed some prospects on the opposite hill side such could not be worked in winter through fear of slides, whilst those being worked on the other hill are constantly annoyed by them. The aim should be to prevent fires and to stop snow slides from forming by leaving timber to stand and grow at least above the mine. A miner would be very foolish to clear the timber back of and above his mine and use it because it was 'handy' thereby exposing himself and his men and mine to the snow slide. On the other hand it is advisable to clear a certain space around the plant in view of a possible forest fire. In felling such timber all branches should be cut off and piled away and burnt by themselves as 'Slashings' are fire traps and common starter of fires.

CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association is the organization in Canada for the propagation of the principles of forest conservation. This it does by means of conventions, meetings, lectures and literature.

It is a popular organization supported by the fees of members, assisted by some government grants.

There is a vast field of work before the Association which is only limited by the funds at the disposal of the Association.

Those who are not already members are invited to join and assist in the work. The membership fee is one dollar per year, and this entitles the member to attend and vote at all meetings and to receive the Annual Report and the *Canadian Forestry Journal*. Women as well as men are eligible for membership.

Applications for membership and requests for literature and information may be addressed to

The Secretary,
Canadian Forestry Association,
Journal Building, Ottawa, Can.

OBJECTS OF THE ASSOCIATION.

(1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.

(2) The preservation of the forests for their influence on climate, soil and water supply.

(3) The promotion of judicious methods in dealing with forests and woodlands.

(4) Tree planting on the plains and on streets and highways.

(5) Reforestation where advisable.

(6) The collection and dissemination of information bearing on the forestry problem in general.

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THE WAR AND AFTER

The war and all its consequences must be accepted. At the same time we must not forget that there will be a time when the war will be over, and then, as in the past, we desire the nation to go on with the greatest amount of prosperity possible. Forests have been burned in Europe as a terrible necessity of war, but they were probably not one-tenth part so large or so valuable as the forests which have been burned in North America because of the terrible carelessness of peace. Whatever strain the war puts on citizens, we must not let go our hold on those basal things on which not only the *well-being*, but even the very *being* of the nation and of the world depends. No matter what happens, it will not do any good to so badly till our fields that they will produce less, or to so neglect our forests that they will burn down. All our civic, provincial, and national institutions must be maintained in full vigor

ACULTY OF FORESTRY
OCT 5 1914

The Canadian Forestry Association could not hold its intended Convention, and some other lines of work will be shut off, but the remaining lines that are not shut off must be worked, so that a year hence, fifty years hence, the cause will be further ahead than it is today. Keeping up the regular institutions of the country is not such spectacular work as some other kinds, but it is just as necessary to the well-being of the state.

DR. WILLIAM SAUNDERS.

Dr. William Saunders, C.M.G., LL.D., F.R.S.C., for twenty-five years Director of Dominion Experimental Farms, died at his residence in London, Ont., on September 13, in his seventy-ninth year. He had been ill for about two years. Dr. Saunders' work for agriculture in Canada is so well known that it is necessary only to refer to it briefly. Born in Devonshire, England, he came to Canada when he was twelve years old. He was in early life a wholesale and manufacturing chemist, and was one of the founders of the Ontario College of Pharmacy, of which he was president for two years. He was founder and president for several years of the Ontario Entomological Society, and for thirteen years edited the *Canadian Entomologist*. He was president of the Ontario Fruit Growers' Association, of the Association for the Promotion of Agricultural Science, and of the Biological Section of the Royal Society of Canada, and was made an honorary member of many important societies.

In 1885 he was selected by the Dominion Government to inspect experimental farms in different countries, and in the three years following the Government established the five original experimental farms and appointed him Director, which post he held till about two years ago, when failing health compelled his retirement. In that period Dr. Saunders built up an international reputation, especially in the field of cereal development. He also did much to develop the plums and other native fruits of western Canada. At the time of the establishment of the experimental farms agriculture in the Canadian West was still in the doubtful stage, and the success of wheat growing in the west has been, in a large measure, due to the work of these farms.

The Late Dr. Saunders.

It will be seen from the above that Dr. Saunders was a man of wide sympathies, one who looked upon farming as part of the national life. In this outlook he included forestry, and he was one of the earliest members of the Canadian Forestry Association, and one of its first Directors. In those days, before conservation was popular, or even tolerated, it had a vigorous champion in Dr. Saunders.

Not only did he believe in forestry in the forests, but he believed in farm forestry. The arboretum and forest belts at the Central Experimental Farm, Ottawa, the plantations at

Brandon, Manitoba, and Indian Head, Saskatchewan, have been a source of inspiration and information in farm forestry, and the western plantings were the forerunners of the system of free distribution of trees to farmers for planting about their homesteads, which has now grown to such immense proportions under the Dominion Forestry Branch.

View at Central Experimental Farm, Ottawa, in Arboretum laid out under the direction of the late Dr. Saunders.

DIRECTOR OF FORESTRY RETURNS.

Mr. R. H. Campbell, Dominion Director of Forestry, Ottawa, returned early in September from a visit of over two months in Europe. He first attended the fiftieth annual meeting of the Royal Scottish Arboricultural Society in Edinburgh, and visited with the members a number of the forest plantations in Scotland. Here he was honored by being made an Honorary Member of the Society, which has done so much to encourage forestry in Great Britain. After visiting some of the English forests, Mr. Campbell went to France, and spent some time in the southwest. He was at Nancy, the seat of the great French forestry school, when the first rumors of war were heard. He passed over to Switzerland, and was there when one country after another declared war. This not only stopped his projected visits to German and Swedish forests, but rendered it difficult for him, for a time, to get back to London, which he eventually did, after some rather exciting and unpleasant incidents.

CALIFORNIA FIRE PROTECTION.

The California State Board of Forestry has issued its annual report for 1913. It shows the reasons for forest protection and the loss which all citizens of the state sustain from forest fires. Besides issuing literature to impress citizens with the enormous waste now going on through forest fires, the Board issues booklets for circulation throughout the schools of the state, to which present the idea in suitable form for the children to grasp. April 18 was proclaimed by the Governor as fire prevention day, when a concerted effort to reduce the number of fire traps was made, particularly on clearings in the farming districts.

Nova Scotia's Forestry Opportunities

Peculiar Situation and Advantages in the Bluenose Province

Those who travel extensively in Nova Scotia for the first time are struck by the large proportion of the soil which is still under woods, and which, to all appearances, is fit only to produce wood crops. In addition to this, the visitor is struck by the suitability of the climate for tree growth. Such a large proportion of the province is absolute forest land (authorities estimate it at from 65 to 70 per cent.) that to allow this to be neglected is not economy, but waste. Highways and railways must be kept up through it to get from place to place, and on the very lowest plane of ecenomy it should be producing freight. Of course, nearly all of it is producing some freight, but, like the cut-over timber land of the rest of North America, it is not producing to the acre anything like it should.

Another thing that strikes the visitor is that the fertile spots are very fertile, and very beautiful as pictures of farming scenery. So much of the land is not fit for farming that Nature seems to have balanced things by making the good parts very rich. Again, the visitor from inland Canada is struck by the presence of two important industries, coal mining and sea fishing.

This produces a state of affairs which is, in many respects, unique. Here there is a naturally good timber country, and right along side of it, and mixed in with it, is territory which requires timber. The mines require pit props, hundreds of miles of them, the fisheries require barrels and kegs and fishing craft, while the farms and orchards need boxes and crates and baskets and barrels. This is in addition to the houses, barns, sheds, fences, and other structures which all need. This very fortunate circumstance has been, in a way, a bad thing for forest industries. The fact that the market is so near at hand, and will use up so much inferior material, has led the people to underestimate the value of the forest. Frequently the man who makes barrels, or kegs, or crates, gets the material off his own property, or from that of his neighbors, and the amount used never gets into the statistics of the province. The Bulletin of the Forestry Branch of the Department of the Interior on the Wood Using Industries of the Maritime Provinces has gathered statistics from six hundred factories and shops in the three provinces of New Brunswick, Nova Scotia and Prince Edward Island, but even this large number, more complete than ever before, one feels sure does not take in all the men, who, for a part of the year, make staves, or hoops, or some other product used locally. This fact has kept, and still keeps, the people of the province generally from realizing the full value of the forest industries, and what it will mean when these industries disappear for want of material. Then the fact that much inferior and small timber can be utilized has led to much closer cutting of the forests than where only lumber of the standard sizes was made.

The apple growers are just beginning to realize that, whereas, ten years ago they paid only for the labor in a barrel or box, they now have to pay as much more for the material; so that the price has about doubled. The same state of affairs exists in regard to fish barrels and mine timbers.

The fact that the fertile lands occur in pockets, frequently in long, narrow valleys, has brought about a condition of things which exists scarcely elsewhere in Canada. Many of the farms have a narrow frontage on the river in the valley, and extend back over the edge of the valley into the hills beyond. Often these farms are four or five miles long. The fertile part is in the valley; the land in the hills is absolute forest land. Very few farmers are content with the income they derive from their fertile acres in the valley. They have been accustomed to supplement this by the sales of timber from the hills. This was a particularly satisfactory arrangement to them because the work in the woods came in the winter, when there was little work to do on their farms. In some respects it is a good way of handling timber. The difficulty is that the cutting has been carried on without regard to the principles of reproduction, and now that the farmers are getting toward the end of their timber they realize that they must either change their methods or suffer a serious decrease in income. This is all the more exasperating as they realize that they could secure

View of avenue of Manitoba Maples at Dominion Experimental Farm at Indian Head Saskatchewan. When these trees were planted scarcely anybody believed that trees could be got to grow between Manitoba and the Rocky Mountains. Now over twenty million trees sent out from the Dominion Forestry Branch Nursery at Indian Head are growing about prairie homesteads.

prices for their timber in the future such as they never dreamed of in the past. Nor is this merely an incident in the general situation. When it is realized that more than half the timber land of Nova Scotia is held in these small blocks, running from two hundred to one thousand acres, it will be seen that when this problem is settled more than half the difficulties are met. In other provinces the provincial government can improve matters by new regulations and by better administration, but in Nova Scotia, where so much of the timber land is owned in fee simple, a great deal of the work must be done by educating the owners. There can be no doubt, too, that a great many of these men are anxious to know what to do, so that a forester who could go among them and give the information would

have his hands full for several years to come. This will probably be the first work of the provincial forester when he is appointed.

Nothing has yet been said of the opportunity for the highest utilization of some kinds of timber in wooden ship building, which business has revived since the crash that followed the introduction of iron ships, and which seems destined to continue indefinitely in the construction of certain classes of vessels. Nor has anything been said of the particularly favorable position in which Nova Scotia stands in regard to export trade, both to Europe and to South America. Nova Scotia is a small province. Her timber has been heavily cut into, and still more heavily burned over, but much of the land is suited to the growing of timber, much of it is covered with woods of some kind, and timber reproduces readily and grows rapidly in the province. She has a number of native industries dependent upon wood, and she has great opportunities for export. All of which shows that action now will result in great advantage to the province in the near future and for all time to come. These are some of the reasons that induced the Nova Scotia Government and the lumber interests to invite the Canadian Forestry Association to hold a convention in the province. There are other aspects of this most interesting situation, and these will be discussed in future issues.

Canadians Honored.

Mr. J. B. White, manager of the woods department and sawmills of the Riordon Pulp and Paper Company, has been appointed a member of the Forestry Committee of the American National Wholesale Lumber Dealers' Association for the ensuing year. The other Canadian member appointed to this committee is Mr. John S. Gillies, of the Gillies Lumber Company, of Braeside, Ont.

TAMARACK IN CAPE BRETON, NOVA SCOTIA.

When traveling in eastern Nova Scotia this summer, the Secretary heard a great deal of the pit prop question, which will be more fully gone into in the future. One of the members of the Canadian Forestry Association there, who is purchasing agent for one of the large mines, has given this matter much attention. This is just another proof of how this question of forest conservation affects every industry in Canada, and directly or indirectly every citizen. This gentleman stated that the mines of Cape Breton use annually about fourteen million feet of mine timber, and in the whole of Nova Scotia about twenty-two million feet are used for mining annually. The pit props used in Cape Breton mines every year would, if placed from end to end, reach 2,300 miles, or nearly from Sydney to Ireland. This gentleman had made observations regarding the recovery of the tamarack after the attack by the larch sawfly, which, in 1885-6, killed all the mature tamarack from Sydney to Winnipeg. In this connection he said:—

'In passing over eastern Nova Scotia and Cape Breton, one cannot fail to notice the great growth of tamarack (so-called juniper) coming up all over the country. It is to be wondered if the people appreciate the valuable asset they have in this wood. Originally tamarack was well distributed, and was largely used for ship and boat building, also for frames of buildings, fence posts, etc., its lasting qualities adding greatly to its value. In 1885 a pest of caterpillars (the larch sawfly) passed over the country, and they seemed to have a particular fondness for the tamarack, for several years after scarcely a young tree could be found alive, but within the past ten or fourteen years it appears to have recovered, and now a strong growth is coming up. Owing to the thickness of this growth, the trees, to be of any value in the near future, should be thinned out. At least four out of every five of the young trees should be cut down to give the fifth a chance to grow. For railway ties, mine props and ties, and many of the uses to which our native woods are put, the tamarack is the most valuable. It would, therefore, appear to be the opportunity and duty of people having the same on their lands to encourage its rapid growth in every way possible.'

A NATIONAL WORK.

A western man writes: 'I think your idea of a national organization is a splendid method of awakening public interest in forest protection.'

Recent Publications

Care of the Woodlot, by B. R. Morton, B.Sc.F. This is Circular No. 10 of the Forestry Branch, Department of the Interior. It may be had free by those interested upon application to the Director of Forestry, Dept. of the Interior, Ottawa. This circular of sixteen pages is intended to be of a popular character, so that the owner of a woodlot may gain the necessary information upon which to proceed to improve the same. Information from the Department is to the effect that it has also proved popular, requests for it having been very numerous. It is the first publication of the kind issued by the Dominion Forestry Branch dealing with the care of wood lots in eastern Canada, all the similar publications previously issued by the branch having dealt with western and prairie conditions. The constantly increasing demand from eastern Canada, particularly the Maritime Provinces, rendered necessary the issue of a publication dealing with conditions where the rainfall is much greater than in the prairies. The writer is Mr. B. R. Morton, who is the officer in the Forestry Branch in charge of farm forestry and woodlots in eastern Canada. The circular deals, first, with Protection from grazing, fires and wind. Next it takes up improvement cutting and thinning. The fullest section is that on Reproduction, which deals with natural seeding, artificial seeding, disadvantages of seeding, planting, and sprout or coppice method, and adds a table of quantities and distances to show how much seed and how many plants are required per acre when artificial reproduction is followed. Those of our members who are contemplating improving their woodlots, or who would like to place something of a brief and popular character in the hands of those who should be improving their woodlots, should send for copies of this circular.

The Bad Results of Grazing.

In the foreground of the picture a wire fence has been erected. The one side has been grazed clean, while on the other ungrazed side the good reproduction to be noted further back has sprung up.—From *Care of the Woodlot.*

The Province of Ontario has issued a pamphlet by Mr. E. J. Zavitz, Provincial Forester, Parliament Buildings, Toronto, which has already gone through two editions, and this is available for citizens of Ontario, but not for the other provinces.

Wood Using Industries of the Maritime Provinces, by R. G. Lewis, B.Sc.F., assisted by W. Guy H. Boyce.

It is safe to say that the wood using industries of a wood producing country like Canada are always underestimated. The raw material is largely produced locally, and keeps up local industries, which are not

regarded at their true worth until they have disappeared from lack of material. The Dominion Forestry Branch is doing a national service in bringing the different parts of the country under review in this way. The above is Bulletin No. 44 of the Forestry Branch of the Department of the Interior, and it may be had free upon application to the Director of Forestry, Ottawa. It has been compiled from reports received from over six hundred manufacturers in the Maritime Provinces, which statement itself shows the importance of the industry. Since it is a study of conditions rather than a census, its figures are likely to be under, rather than over, the mark. It shows that, aside from the export trade, at least two hundred million feet of timber are annually required to supply the wood using industries of New Brunswick, Nova Scotia and Prince Edward Island. The value of this material is over $3,684,000. Twenty-eight different kinds of wood are used. The industries are divided into the following: Woodpulp, building construction, cooperage, boxes, cars, boats, furniture, coffins, foundry boxes, vehicles, machinery parts, patterns, agricultural implements, handles and fruit baskets. The Bulletin forms a pamphlet of one hundred pages, in which the subject is treated in all its relations. Those who desire to keep in touch with this industry in these provinces should send for a copy.

First Annual Report of the Botanical Office of the Province of British Columbia, 1913, by J. Davidson, F.L.S., F.B.S.E., Provincial Botanist, printed by the King's Printer, Victoria, B.C. This is a handsome report of thirty pages on heavy paper, illustrated by many inserted maps and engravings. The object of the Botanical Office is to form a provincial herbarium of the native flora, to collect information and literature relating to the same, to make records of native species, etc. The report shows that this work has been entered upon energetically, and that the reproach that the best collections of British Columbia flora are to be found in Ottawa and Washington will soon be removed.

DROUGHT TESTS FOREST FIRE PROTECTION PLANS.

The efficiency and resources of all forest-protective organizations in Canada have been put to a severe test this year by the prolonged drought which prevailed throughout the greater portion of Canada during the early part of August. It seems probable that 1914 will be recorded as the worst fire year since 1910. The situation in southern British Columbia has been very serious, and great areas have been burned over in Alberta, on the east slope of the Rocky Mountains. Northern Ontario has suffered severely.

The railways are no longer the chief source of forest fires, and the necessity for a stricter control of the setting of fires by settlers for clearing land is becoming increasingly apparent. Also, in many sections, especially on cut-over lands, where most of the fires originate, the establishment of a more adequate patrol system is essential to protect young growth and prevent the spread of fires into old timber. The extension of the merit system in the appointment of fire rangers in the services of both the Dominion and Provincial Governments is necessary if the best results in fire protection are to be secured.—Clyde Leavitt, in *Conservation*.

NEW FORESTRY JOURNAL.

The Biltmorean is the name of a quarterly publication issued in Cadillac, Michigan, to take the place of *The Biltmore Doings*, which ceased when Dr. Schenck gave up the work of the Biltmore Forest School. In the opening editorial it is stated that *The Biltmorean* is the result of a desire on the part of many of the graduates of the Biltmore Forest School for a school paper which should serve as a medium of correspondence between all Biltmoreans, as a tie to bind the friendships formed in the school-days, as a fitting record of the achievements of graduates and their opinions and methods, and as the upholder of the good name of the Biltmore Forest School among the host of other institutions dedicated to Forestry, and the allied pursuits.

FIRE PREVENTION NOTICES.

The Crown Lands Department of Nova Scotia has, for the most part, discarded the old method of printing extracts from the laws against fire as fire notices, and has adopted the plan of printing short, pithy sentences to remind the camper of the immediate need. Here are some of the posters:—

FOREST FIRES CAN BE PREVENTED.
Use your influence against
CARELESSNESS,
And Make 'Caution' the By-Word When in the Woods.
Preach Forest Protection and Practice it Too.

Pipes, Cigars, and Cigarettes are
DANGEROUS.
A Fire from Your Pipe Means That You Alone Are
RESPONSIBLE.
Be Careful.

Killing of Larch in Nelson Forest District.

Mr. H. R. MacMillan, Chief Forester and Provincial Entomologist.

In July, 1913, clumps of 'red-tops' were noticed amongst the mixed stands of western larch on the mountain slopes above the Arrow Lakes. The trees affected were comparatively few in number, and were chiefly at an elevation of about 3,500 feet. It was not found convenient to make a study of the causes of the damage during the season, the attention of Mr. Swaine being devoted to the more important outbreaks of insects on other species.

The affection, however, as noted, has spread with extreme rapidity, and may be expected to be reported soon from other localities.

The larch in this district is not a very important tree. In the forest it appears as tall, clean timber. Its product does not justify its appearance. The butt is heavy, and trees which are to be floated or driven must be long butted four to eight feet. The butt logs are usually very shaky, and when dry practically fall to

Birch Planted Too Far Apart.

This picture shows an undesirable, grassy condition, the result of planting too far apart a tree which naturally produces little shade.—From *Cops of the Woodlot.*

In May, 1914, a trip through the same country showed an enormous increase in the number of 'red-tops.' Apparently the greater part of the larch on both shores of the Arrow Lakes, from water level to the upper limits of the species, is affected so seriously as to cause the destruction of the foliage. The affected trees, in many cases, form a third or more of the forest stand. The burns of several years ago have, in many places, reforested, one-quarter to one-half of the young stand being larch. The young larch, as well as the old, appears to suffer.

pieces, and, therefore, the trees are usually long butted, even where the logs are not to be floated to the mill. The lumber is heavy and pays a higher freight charge than other interior timbers. As is true with other western timbers, the defects and characteristics vary in different districts. There are places where it is not necessary to long butt western larch. It is not, however, a favorite tree with the manufacturer or timber owner.

Should the killing of the larch result in its displacement in the forest by either lodge pole or western white pine, its two

most valuable competitors, or even by Douglas fir, which, in this particular district, is only a medium grade timber, the forest will be improved. The great danger from this infestation is not so much the loss of the larch, but the increased fire hazard. Over contiguous areas of a hundred or more square miles the larch forms ten to thirty per cent. of the forest. Should this timber be killed, as appears likely, the danger of destructive fire will be greatly increased, and it will be practically impossible to check a fire which escapes into a forest containing such a large proportion of dead timber.

The appearance of large areas affected by insects, as this one appears to be, suggests that the great fires of the past in the western forests have, perhaps, been fed to the maximum destructive pitch by 'bug-killed' timber.

No remedy for a large scale insect attack has yet appeared possible. Perhaps parasites may be introduced which will hold in check the insects most destructive on yellow pine, white pine and larch, the three western species most affected. If such parasites are not found it is likely that we may look for some seriously destructive beetle attacks. The insects are present, and it only requires a combination of conducive natural conditions to prepare a wholesale devastation of some districts. Their spread is probably encouraged by the absence of birds in British Columbia and the increased number of favorable breeding grounds, which are being provided in the weakened trees of clearing and logging operations.

The study of destructive forest insects by the Entomological Division is welcomed in British Columbia.

LOWER OTTAWA FOREST PROTECTION.

The Lower Ottawa Forest Protective Association, which was organized last spring, has had a very active season, due to the dry periods of May, July and August. The association employs 49 permanent rangers, four inspectors, and as many temporary labourers as may be required for the control of individual fires. During the dry spell in May more than 500 extra fire fighters were on duty at one time in the employ of the association. Since the organization of the association the area protected by it has been increased by 2,000 square miles, through the accession of new members. The total area now guarded is 11,812 square miles, or upwards of 7,500,000 acres. The association has recently secured convictions against 40 settlers in the Ste. Agathe, Mont Laurier, and Maniwaki districts for setting fires without permits, and it is expected that these convictions will result in greater care with such fires in the future. In all probability the excellent results secured by the Lower Ottawa and St. Maurice associations will lead to the formation of similar associations in other sections of the country.—Clyde Leavitt in *Conservation*.

SALT WATER PRESERVES TIMBERS.

Professor John Macoun's Observations Confirmed.

In replacing a railroad trestle recently burned along the north shore of Great Salt Lake, engineers have just found that the piles are still perfectly sound, after 43 years of service. Looking for the cause, since these were only of local pine and fir, they found the timbers were impregnated throughout with salt from the lake.

The first transcontinental telegraph line, built before the railroad, extended west from Salt Lake City through the prosperous mining camps of Eureka, Austin and Virginia City. When the railroad was built the telegraph line was transferred to follow its right of way, and the old poles sawed off at the ground. An engineer who recently examined the butts left in the ground in the salt desert near Fish Springs found that, although fifty years had passed since the poles were cut off, the old butts were perfectly sound.

Telephone and electric companies in the Salt Lake Valley have used the local salt for preserving poles. When set up about 75 pounds of salt is placed around the pole on the ground. This method cannot be used, however, when the pole is on or near a lawn, or in any place where vegetation is desired.

It is pointed out that the reason why the waters of Salt Lake act as a strong preservative, as distinguished from ocean waters, is because the lake water is so much saltier, being practically a saturate solution. Preservation with salt is of no use in ocean piling against the attack of teredos and other marine borers.

Experts in the forest service who have been investigating the preservative treatment of timber offer the suggestion that ties and poles which have been immersed for some time in the waters of the lake ought to be impervious to decay if the salt is not leached out by the action of the elements. It has bene suggested that this can be guarded against, for example, by painting the butt of the pole with a coat of creosote, which will keep out the moisture and keep in the salt.

In this connection it is interesting to note that for many years Prof. John Macoun, of the Canadian Geological Survey, has advocated this method of preserving timber. In the Summary Report of the Geological Survey for 1908, page

187. Prof. Macoun gave facts on this matter. At the Canadian Forestry Association Convention in Ottawa, in February, 1912, Prof. Macoun, speaking on the preservation of railway ties, said that he had been on both Atlantic and Pacific coasts for many years, and that he had never seen a tree subject to the tides and well soaked with brine that ever produced a fungus, in other words, that ever rotted. Yet, go back into the bush a short distance and you would find logs of the same kind which had begun to rot as soon as they were felled.

To this Mr. E. A. Sterling, then forester for the Pennsylvania Railroad, said: 'This is a very interesting bit of information, and I am glad to have it as confirming our own idea. I have a lot of ties in pickle in Great Sale Lake. They were put there because of the high percentage of salt carried by the water.'

MAPLE DAY.

The co-operative fire prevention associations are not the only bodies that find it advisable to distribute literature and articles that will attract attention to the cause in hand. Makers of maple sugar in Quebec, this year, made July 1 'maple day,' and sent out to the largest hotels, all the railway dining cars and steamships little boxes containing a piece of pure maple sugar, to be served to every guest that day. Accompanying this, the Government of Quebec Province sent out a little booklet explaining the extent of the maple sugar industry in that province, and the efforts that have been made to improve the quality of the product. The object was to draw the attention of the public to this product, and to promote its use. The plan attracted widespread attention, and was very favorably commented on. In sympathy with this, the Canadian Pacific Railway issued a specially designed menu card on this day in all its hotels, steamships and dining cars, bearing a picture of the maple leaf, in which was included for each meal a number of dishes in which maple syrup had been incorporated. In this campaign over 28,000 pamphlets and samples were used.

As was pointed out some time ago in these pages, the new clause added to the Adulteration Act of Canada this spring, dealing with maple sugar and maple syrup, is very stringent. Henceforth it will be possible to get pure maple products in Canada, and this fact, it is believed, will stimulate the trade in maple products and exert a wholesome effect on the movement to prevent the cutting down of maple groves on soils unfit for ordinary agriculture. The new section of the Act is as follows:—

'No person shall manufacture for sale, keep for sale, or offer or expose for sale, as maple sugar any sugar which is not pure maple sugar, nor as maple syrup any syrup which is not pure maple syrup, and any maple sugar or maple syrup which is not up to the standard prescribed by the sixth schedule to this Act shall be deemed to be adulterated within the meaning of this Act.

'The word "Maple" shall not be used either alone or in combination with any other word or words on the label or other mark on a package containing any article of food or any article of food itself which is or which resembles maple sugar or maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act.'

HON. GEO. H. PERLEY,

One of Canada's Leading Lumbermen, who recently became a director of the Canadian Forestry Association.

The forests of Corsica, the little island upon which Napoleon was born, are managed by the French government. They produce lumber, firewood, and turpentine, and all parts of the tree are far more closely utilized than in America.

PRIVATE CITIZENS AND FORESTRY.

A member of the Canadian Forestry Association, who is the owner of a flour mill and water power in Central Ontario, writes:—

'I have been interested in the cause of forestry since I was a boy in my teens. I am a lover of trees and woods. I own here some four hundred acres, about half of it covered with woods. I have controlled this for about thirty years. I am generally considered pretty liberal in money matters for my limited means, but I must plead guilty to being a miser when it comes to cutting down a tree. I never cut a tree down except I have to, or where they require thinning, have reached maturity, or are badly shaped.

'I can look back to the time when I was a boy and see acres of mere saplings that are now of merchantable size. When I reach the alloted three score and ten years —if I do—I will have quite a valuable property in trees. The only thing I don't like about it is that after I am through with it, whoever follows me may see in each tree so much cash, and into cash they will go. However, I suppose when I reach the Happy Hunting Grounds, that forestry matters will not trouble me.

'My woods, of course, were cut over before I got them, and the largest and best trees taken out. I have done no planting except along fences, but I am protecting and helping what I have. It is really a shame to see bare hillsides that were once covered with valuable timber, cleared of all timber and undergrowth, so that now the largest plant on them is a mullein. They will now grow nothing of any use, not even pasture. I can understand good farming land being claered to get the land to raise grain, but why steep hillsides and sand hills were cleared of every vestige of tree life I can never understand. Had they taken the merchantable trees and left the saplings there would have been some excuse.

'I can see a great difference in the stream that drives my mill. We used to waste as much water as we now have altogether. In summer and early winter the stream is low. Warm days in winter and early spring and a little rain gives us larger floods than we used to have. Years ago a rain would slowly raise the water. It would be higher than usual for, perhaps, three or four days, but not any flood about it. Now, however, it means a flood in a few hours and back to normal flow. The floods cut into the banks and carry away hundreds of tons of good soil every year on this small stream. This is only an index of what is taking place all over the country.

'I hope the governments will make much more stringent laws for forest protection and forest reproduction. Private individuals can do a lot in saving our woods and forests, but the great responsibility now rests with the governments and such organizations as the Canadian Forestry Association.'

REFORM FOR THE OUTSIDE SERVICE.

Professor Adam Shortt, commissioner of the Civil Service Commission of Canada, has just returned from the United Kingdom. He has been making an extensive investigation into the workings of the inside and outside branches of the Civil Service of Britain, and has gathered much valuable information, which will be embodied in a report which he is preparing.

Referring to the question of appointments, he stated to a newspaper interviewer that in the outside service the influence of politicians had been completely eliminated in the appointment of postmasters, customs and inland revenue officials. In the staffs of these departments there was no interference on the part of members of parliament or local politicians. All appointments were settled by the various heads of departments in London, and the district inspector. The Civil Service Commission system worked very well in all the centres visited. An extensive system of promotion exists in the postal and inland revenue branches, whereby officials from any part of the country are eligible for appointments in any other part of the country. 'This shows the complete practicability of the efficient working of the service without political interference,' said the Commissioner.—Ottawa *Civilian.*

NATIONAL CONSERVATION CONGRESS REPORTS.

Two books have been published dealing with the proceedings of the Fifth National Conservation Congress, held in Washington, D.C., last November. One of them treats of Water Power subjects exclusively, and is an important contribution to constructive literature in this subject. The other book contains the Forestry reports and addresses, which were conceded to be the most valuable ever presented at a similar meeting in this country. The books may be had for one dollar each, through N. C. McLoud, Treasurer and Recording Secretary of the Congress, 1201 Sweetland Building, Cleveland, Ohio.

No other organic substance occurs in such abundance as wood, and few if any are more generally useful. About 150,000,000 tons of wood are still wasted annually in the United States. — *Arthur D. Little, Chemical Engineer.*

With the Forest Engineers.

WORK IN SASKATCHEWAN.

Mr. E. H. Roberts, Forest Assistant, Dominion Forestry Branch, Prince Albert, Saskatchewan, writes:—

'The Dominion Forestry Branch have three reconnaissance parties in the field here examining lands and locating suitable areas for inclusion in forest reserves. Another party is examining boundaries on the already established reserves, with a view of making additions where the land is unsuitable for agriculture, so as to straighten the existing lines and facilitate the fireguarding, as well as making the blocks more compact and easier handled. On the smaller prairie reserves, which are mostly without any tree growth at present, grazing permits have been granted for the running of stock, and many of the settlers surrounding these areas are gladly taking advantage of the privilege. On the older established reserves, the improvement work is going ahead rapidly. The erection of ranger houses, steel look-out towers, and the construction of telephone lines is under way. Fireguarding the boundaries and the plowing of the same is keeping some of the rangers busy. The railroad fire patrol has been doing good work thus far, and most of the roads travelling the bush country have their right-of-way well cleaned up, things being in better condition than at any previous season. The fire ranger service in the north country is doing well. Another new patrol boat was installed this spring on the lower Beaver River and in the vicinity of Isle a la Crosse. The forest nursery on the Pines Reserve is in fine shape, and the beds that were planted last year are making a remarkable growth this season.

'The newly located gold-fields at Beaver Lake, north of Cumberland House, are attracting considerable attention, and the influx of prospectors is keeping the fire rangers in that district very busy.'

NOTES FROM KAMLOOPS.

Mr. P. Z. Caverhill, District Forester of the British Columbia Forest Service at Kamloops, writes:—

'This district embraces that portion of British Columbia extending north from the Dominion Ry. Belt to the head waters of the Clearwater, North Thompson, Adams and the Columbia Rivers.

'In taking charge, I found that the district was wholly lacking in transportation facilities. In fact, even the rudiments of trails usually made by Indian hunters were missing, no doubt owing to the semi-coast type of the timber and the difficulty of getting through owing to the amount of down timber. Improvements were therefore our first consideration. One hundred and twenty-two miles of the most needed trails were constructed, and sixty miles of telephone, this being only a start.

'A start was also made in the disposal of brush after logging operations. The debris, after a couple of operations, was burned broadcast last spring. On tie permits the brush was piled, but has not yet been burned. An interesting sequence of this operation is the keen interest which the settlers are taking in brush disposal. They are now requiring almost all operators on their land to pile the brush. This is going to be a great help in the future fire situation.'

HARVARD COURSE IN LUMBERING.

At the request of prominent lumber interests, a two-years' course in the business of lumbering is to be given next year by the Harvard Graduate School of Business Administration, in co-operation with the Harvard Forestry School.

LAVAL FOREST SCHOOL.

The Laval Forest School reopened for the session of 1914-15 on Tuesday, Sept. 15. The school resumes its sessions in the new building especially erected for it in conjunction with the School of Surveying and the Law School.

A couple of changes have occurred in the faculty. Prof. Paradis, C.E., professor of mathematics and topographical surveying, has resigned, and his courses are being given by Prof. Mercil, professor of mathematics. Mr. Maheu, F.E., a graduate of the school, has been appointed instructor in entomology and mycology, and will also act as secretary of the Director.

There are now thirty-one students in attendance in the three undergraduate classes.

Of the twenty-seven graduates, all are employed. Eighteen of them are in the employ of the Provincial Government, and nine are with other governments, or in private employment.

It is proposed to have a committee of three members of the Quebec Limitholders' Association as an advisory committee to consult with and advise the administration of the school, with a view to bringing the

course into the greatest possible conformity with actual operations and conditions, and so make the graduates increasingly valuable to the lumbering industry. The members of this advisory committee would represent, respectively, (1) the eastern, (2) the central, and (3) the western districts of the province.

QUEBEC NOTES.

Bulletin No. 2 of the Forest Service of the Province of Quebec will be issued shortly. It will consist of a general description of the forests of the province. Bulletin No. 1, the list of sawmills and other wood-using industries, will be revised and re-issued, the industries being classified by industries as well as places.

A co-operative arrangement has been entered into by the Dominion and Quebec (Provincial) Governments for the joint collection of statistics in regard to wood-using industries.

CONCRETE TIES INFERIOR TO WOOD.

Mr. L. M. Ellis, Assistant Superintendent of Forestry for the Canadian Pacific Railway, has been securing data regarding the use of concrete ties as compared with wood. The Chicago and Alton Railroad has found concrete ties distinctly inferior, as given in a letter to Mr. Ellis. The Chief Engineer says:—

'There were 60 concrete ties placed in the track in October, 1903. They were placed in the track and ballasted with stone, where they had good drainage and were kept in good surface. In 1906 there were 12 concrete ties changed out; in 1911, 32; in 1912, 10, and 1913, 6. These ties were changed out on account of crushing and breaking down under the rail and unsafe to remain in the track. Ties were constructed of cement, iron girder and oak block. There were two blocks of concrete 7″ thick, 9″ wide and 3′ long. There was an iron girder that ran through the blocks that was 2″ thick and 2″ wide; there was an oak block 3″ thick and 10″ wide and 24″ long, set on top of the concrete tie to use for cushion of rail and to spike rail. There was a wooden plug in the concrete to hold the spike to place.

'These ties weighed about 450 lbs., and when track was surfaced the ballast had to be dug out from between the ties. If this was not done the rail would lift up and ties would stay in ballast on account of their weight. When track heaved slightly in the winter it caused track to become slightly uneven. The ties under the heavy part of the track would crush and break, and this left the track unsafe. We were compelled to place oak track ties between the concrete ties to hold track to gauge. After the six years' test I have concluded that concrete ties of this make are a failure.'

C. S. F. E. DISTRICT EXECUTIVE COMMITTEES.

The "District Executives" provided for at the last (1914) annual meeting of the Canadian Society of Forest Engineers have been elected as follows:—

Ontario.—Clyde Leavitt, chairman; T. W. Dwight, J. H. White.

Quebec and Maritime Provinces.—G. C. Piché, chairman; A. Bedard, R. B. Miller.

Prairie Provinces.—N. M. Ross, chairman; L. M. Ellis, W. Alden.

British Columbia.—H. R. MacMillan, chairman; D. R. Cameron, W. J. VanDusen.

NEWS OF FOREST WORK.

Survey parties are beginning to come in from their season's work, and other field work for the year is nearing completion. *The Canadian Forestry Journal* desires to get from leaders of parties and other foresters notes of their work, and items of interest to foresters generally. Address, James Lawler, Editor, *Canadian Forestry Journal*, Journal Building, Ottawa.

CAMPBELL-RUSSELL.

Mr. Roy L. Campbell, B.A., B.Sc.F. (Toronto, 1914), son of Mr. and Mrs. A. C. Campbell, of Ottawa, was, on Sept. 9, married to Miss Helen Russell, B.A., daughter of Mr. and Mrs. Thomas Russell, of St. Mary's, Ont. The wedding was selemnized by Rev. R. Fowlie, of Collingwood, uncle of the bride. Miss Jessie H. Russell was bridesmaid, and Mr. Gordon Bole, B.A., of Winnipeg, groomsman. Mr. and Mrs. Campbell have taken up their residence in Montreal, where Mr. Campbell is the editor of *The Pulp and Paper Magazine*.

OUR FEATHERED HELPERS.

The birds not only make our woods, forests and parks more beautiful and enjoyable, but they are of the greatest practical value from an economic view-point. They are the greatest foes of, and protection against, the insects, which annually destroy or injure crops and trees to the value of hundreds of millions.—Rochester Times.

Canadian Forestry Association

THE Canadian Forestry Association is an independent organization of patriotic citizens, which has for its object the highest development of the soil and resources of Canada by urging governments, municipalities and owners generally to devote each acre to that for which it is best suited, and particularly to keep under forest those soils fitted only to grow trees.

The Membership Fee is one dollar per year. Members receive free of any additional charge the Annual Report and *Canadian Forestry Journal.*

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The school year in 1914 begins July 1 and is conducted at the school camp at MILFORD, Pennsylvania.

For further information address

JAMES W. TOUMEY, Director
NEW HAVEN - - - - CONNECTICUT

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C. F. A. REPORT IN FRENCH.

After many delays the report in French of the work of the Canadian Forestry Association covering the Ottawa, Victoria and Winnipeg Conventions has been printed and mailed to a long list of members and others. It has been sent to the bishops and curés of Quebec, to heads of educational institutions, and to the secretaries of school districts. The latter are in most cases municipal secretaries also. The effort has been to take the best things, the things most useful to the Province of Quebec especially, out of these three conventions and place them in one volume. The result is a book of one hundred pages, which it is believed will be very useful.

Those of our members who desire a copy and have not yet received one will be supplied without charge by applying to the Secretary, Canadian Forestry Association, Ottawa. Copies will also be available for general distribution so long as the supply lasts.

ULTY OF FORESTRY

U. S. LUMBER PRODUCTION IN 1913.

The United States Forest Service reports that the production of lumber in the United States in 1913 was 38,387,009,000 board feet, which represents a decrease of about three-quarters of a billion feet from the total reached in 1912. The high water mark of lumber production was attained in 1909 when the cut exceeded forty-four billion feet. In 1913 there was an increase as compared with the previous year in the cut of Douglas fir and yellow pine, and a decrease in white pine, hemlock, spruce, oak and maple. This change in the quantities of certain woods indicates increased production in Washington and Oregon and the Southern States and decreased production in the Northern, Central and Atlantic States. Of the total production in 1913 soft woods contributed a little over thirty billion feet.

FOLLOWING CANADA'S LEAD.

The good work done by the Dominion Forestry Branch in the past twelve or thirteen years in distributing trees to settlers in the prairies for windbreaks, and ultimately for fuel and timber, is to be followed by the United States Forest Service. Mr. W. A. Peterson, Superintendent of the newly established Field Station at Mandan, North Dakota, U.S.A., recently visited the Dominion Forestry Branch Nursery at Indian Head in order to get information as to the methods employed in handling the trees to settlers in Canada. It has been decided that the United States Forest Service will in the future distribute trees to prairie settlers from Mandan in the same manner as the Dominion Forestry Branch has been distributing them from Indian Head. The province of Ontario has for a number of years been distributing trees to farmers from Guelph and latterly from the nursery station at St. Williams. In both the above cases the trees (except special kinds for which a small charge is made) are distributed free, the recipient paying the express and undertaking to give cultivation for a period of three years. The province of Quebec during the past two years has distributed trees at a very low price from the provincial forest nursery at Berthierville. It is interesting to know that Canada has been leading in this matter, but some of the other provinces, notably the Maritime provinces, might well assist in the work of farm forestry by similar methods.

CANADIAN PACIFIC RAILWAY ACTS.

In order to relieve the unemployment caused by the war, the Canadian Pacific Railway management, at the end of September, decided to take on six thousand extra labourers for two months, to do work along its lines. It is understood that a good deal of this work will consist in clearing debris from the right of way to reduce the risk of fire spreading from the locomotives. This is a satisfactory action from whatever standpoint it is viewed, and the only regret is that the other railways do not see their way clear to do likewise.

UTILIZING MAIL CARRIERS.

The United States Post Office Department, in its postal guide, instructs rural mail carriers to report forest fires which they observe when on their routes to the proper authorities. The railways in Canada, the Bell Telephone Company, and other companies have inserted instructions regarding forest fires in their time tables and directories, and this idea of having rural mail carriers linked up with the protecting agencies is one worthy of the consideration of the Canadian Post Office Department.

Royal Scottish Arboricultural Society Jubilee

The accompanying picture represents the group of distinguished visitors who were the guests of the Royal Scottish Arboricultural Society on the occasion of the celebration of the sixtieth anniversary of the founding of the society. The picture was taken at Benmore, where the party were inspecting some forest work. In addition to distinguished foresters from different parts of the British Isles and British Dominions, there were representatives from France, Denmark, Holland, Sweden and Russia. Mr. R. H. Campbell, Dominion Director of Forestry, who represented Canada, was the only visitor from North America. Mr. Campbell may be recognized [illegible] row.

In its sixty years of work, this, the oldest forestry propagandist organization in the British Isles, has learned many things which are of use to Canadians in their work. It is curious to note that with the exception of the question of ownership (nearly all the forests of Scotland being privately owned) the problems presented

Excursion Party of R. S. A. S. at Benmore, Scotland.

are much the same as in Canada. There is the same apathy of the general public, the same difficulty in getting large bodies to hove, and there is the education difficulty. The Royal Scottish Arboricultural Society meets the situation in much the same way as the Canadian Forestry Association. It carries on its work by meetings and by literature. It holds its annual meeting in the winter and in summer it holds a summer meeting in the nature of an excursion. Some years ago a departure was made in extending these excursions, not only to England and Ireland, but also to continental Europe. This has bene a most important and successful plan. Members who go to France, or Germany, or Sweden, come back with an increased store of knowledge and enthusiasm. These excursions abroad are taken on alternate summers, the intervening year the excursion being held in Scotland. So beneficial has this plan of alternate home and foreign excursions proved that the society has taken on new life from the time of its introduction. One of the special aims of this year's excursion was to have foresters from abroad see the forests of Scotland and suggest methods by which the situation might be improved.

This year the leading members of the society and the special guests began their tour on June 27, and, after visiting estates on the west and east coasts, met the main body of the society at Oban. Three days more were spent in visiting forests in the neighbourhood in which about two hundred participated, and the excursions were concluded at Benmore, where the above photograph was taken.

Because of the stirring up by the society a good deal of information has been gathered. It is considered, on a careful estimate, that there are about nine million acres in Scotland which might profitably be retained in forest. Some of this is now in forest, but the greater part is in the so-called 'deer forests,' which are really not forests at all, and in grazing lands. In some cases a number of crofters till small patches of land in the valleys, and graze sheep and cattle on the uplands. It is not proposed to turn everything upside down at once, but a careful review has shown that part of the poorest of the land used for grazing might be put into forest, with the result that not only would the districts sustain a considerably larger population, but the people would be better off, as they would have winter work in the woods.

To accomplish, the society has chiefly to convince individual owners. Some owners are convinced, but lack the necessary capital to turn their grazing lands, which bring them in an annual return, into forests, which, in the beginning, will not turn them in cash for a good many years, even though eventually the profits will be greater.

In regard to the part the Government is playing in this question, this has been so far chiefly confined to demonstration forests, and the aim of the society has been to secure more and better demonstration stations So far all the examples are of forest plantations, none of them more than a comparatively few years old. They desire the Government to secure some lands already forested, so that experiments in cutting, thinning and rotation may be made at once for the benefit of private owners.

One thing that they have learned in Scotland is that the rapidity of growth of different trees varies greatly in different districts, even though separated by a comparatively short distance. In the Highlands and on the east coast the Scotch pine thrives well, but in the very damp districts of the west coast, where the rainfall runs from 90 to 120 inches per year, its growth is much surpassed by the Douglas fir imported from British Columbia. And again, where the position is both wet and exposed to high winds, the latter cedes first place to the Sitka spruce, also an importation from the Pacific coast.

We are accustomed to think of Great Britain as an old country of small area, all of which has been so carefully surveyed and examined that all resources are fully known and are in process of full development. This is a mistake. There is a body, known as the Development Commission, charged with the duty of examining into any features of agriculture, forestry, mining, fishing and the rest that may promise increased wealth for the country, and to make recommendations in regard to their development. It is this body which, in the first instance, provides the funds to purchase demonstration forests, and these forests are then placed under the direction of the Woods and Forests Branch of the Government.

In regard to forestry education, Scotland, like North America, is now suffering from too many schools. One good school would supply all the foresters required for Scotland if all the available land were now covered with forests, but at the present there are three schools, no one of which is willing to make way for the others.

MR. R. H. CAMPBELL,

Dominion Director of Forestry, Made an Honorary Member R. S. A. S.

These are some of the problems before the people of Scotland, problems which the Royal Scottish Arboricultural Society is helping to solve. The society has gone at its task with enthusiasm and perseverance, and there are a number of features of its work, notably that of the annual excursion to forest districts, which the Canadian Forestry Association may study to advantage.

To be consistent, the man who sits back and expects that nature will replace the burned forest might also expect the supply men and the mechanics to replace, free of cost, that which they had supplied or produced, and which, through carelessness, had been destroyed by fire.

Ontario Forests: Revenue and Protection

Extracts from the Report of the Minister of Lands, Forests and Mines for Ontario for the year ended Oct. 31, 1913:

Revenues.

Total revenue accruing from woods and forests for the year: $2,127,222, an increase of $59,162.

Revenue collected: $1,979,125, a decrease of $6,000 from previous year, which was a record exceeding that of the next preceding year by $274,000.

Revenue from timber dues: $1,277,490; decrease $62,467.

Bonuses: $591,676; increases $50,974.

Ground rent: $99,460; increase $3,198.

Area and Output.

Area under license: 17,519 sq. miles; decrease 891 sq. miles. This fluctuates as areas are cut out and surrendered, others forfeited for non-payment of dues, etc.

Output of pine timber: 360,377,168 feet board measure; decrease 127,661,498 feet.

Output of timber other than pine: 64,498,036 feet b.m.; decrease 4,876,536 feet.

Pulpwood: 131,434 cords; decrease 8,904 cords.

Railway ties: 6,355,828 pieces; increase 651,269 pieces.

Cause of reduction: scarcity of money.

Fire Ranging.

Fire rangers on forest reserves, 217; on railways, 208; on Crown lands, 114; chief rangers, 34; assistant chief rangers, 4; supervising rangers on licensed lands, 8; total Ontario Government officers and rangers, 585; rangers employed by lumbermen on their limits, 350; grand total, 935 fire fighters.

Forest Reserve Ranging.

Temagami reserve: area, 6,000 sq. miles; 137 rangers and 4 chiefs.

Mississaga reserve: 3,000 sq. miles; 32 rangers, and a chief ranger.

Nepigon reserve: 7,300 sq. miles; 20 rangers, in addition to those on railway construction in the reserve.

Quebec reserve: 1,500 sq. miles; 14 rangers under the Crown Timber Agent.

Eastern reserve in the county of Addington, 100 sq. miles: 6 rangers and a chief ranger.

Algonquin National Park: 2,741 sq. miles; 10 rangers in addition to the regular [illegible]

Railway Lines Ranging.

Temiskaming and Northern Ontario Railway: 58 rangers, 3 superintendents.

National Transcontinental Railway: 68 rangers, 3 chiefs.

Algoma Central Railway: 26 rangers, 2 chiefs.

Expenditure on Fire Ranging.

On Crown lands $65,000, on railways $80,000; on forest reserves $88,000, total $233,000. This is in addition to the amount spent by the lumbermen which outsiders (not the report) estimate at $105,000. Grand total spent on forest fire protection in Ontario, $338,000.

HON. W. H. HEARST,
Premier of Ontario.

Hon. W. H. Hearst, Minister of Lands, Forests and Mines in the Government of Ontario, who, since the death of Sir James Whitney, has been made Prime Minister of Ontario.

Forest Insect Investigation in British Columbia

In response to a request for information in regard to the work during the past summer in British Columbia Dr. C. Gordon Hewitt, Dominion Entomologist, sends the following:—

'The forest insect survey in British Columbia which was undertaken last year in co-operation with the Provincial Forest Branch, has been continued during the past summer. Mr. J. M. Swaine, in charge of Forest Insect Investigations, spent June and July in continuing this work, and Mr. R. N. Chrystal, Field Officer for Forest Insects, has been stationed in British Columbia throughout the season. Our knowledge of the districts infested and the extent of the more serious outbreaks has been greatly extended and valuable additional information has been obtained in regard to the habits of some of the destructive species involved. We have also been making detailed studies of the injurious insects which have brought about the present unfortunate conditions in Stanley Park, Vancouver.

'It is found that the amount of dead hemlock in Stanley Park is now much greater than in September of last year, many trees having died during the fall and winter. The spruce trees along the driveways are now so badly injured by the Spruce Gall Aphid that few of them are worth saving. Fortunately the greater part of this foliage is hemlock and Douglas fir and is still (August 1st) in fair condition. The large spruce in the interior of the Park are now attacked by the Sitka Spruce Bark-beetle. This infestation is serious and control measures will be necessary this winter if the remaining large spruces are to be saved.

'The dead timber in the interior of the Park is chiefly hemlock and of this there are large areas. The trees have been killed by repeated defoliation by *Therina* caterpillars, assisted by woolly aphides during the early season. The caterpillars are not so numerous this season and there is as yet little defoliation. It is possible that their parasites have already obtained control and that the worst of the outbreak is now over. If this proves to be true the spraying which has been recommended will not be so necessary for the present. The dying and recently killed trees are serving as breeding places for injurious insects and fungi that will later help to weaken and kill the healthy trees. The Western Hemlock Bark-beetle, a destructive species, is already established in these dying trees. It will, therefore, be necessary to remove and properly dispose of this dying and dead hemlock during the coming fall and winter; and if the areas thus denuded are reforested to Douglas fir, the most healthy timber tree of the province, such portions of the Park will be put in perfect condition for all time. It should be made a settled policy to replace the hemlock as it gradually dies, by the much more healthy Douglas fir.

'The Bark-beetle infestation in yellow pine in the Okanagan district is more extensive than at this time last year and appears to be spreading rapidly. The amount of new infestation for the present season will be estimated later. The infested area surrounds Okanagan Lake and extends as far west as Princeton and Nicola. In the districts which have been infested longest the destruction is enormous. Above Peachland, on Okanagan Lake, the yellow pine and the black pine have been practically killed off by the beetles, and the hillsides appear as though swept by a great fire, only the islands and strips of Douglas fir remaining green. This infestation of the yellow pine and the black or 'jack' pine is a very serious matter and timber owners in the infested region and about its extending margin should take due precautions to check its spread. Fortunately, such outbreaks can be controlled, if taken in time, and under favourable conditions in districts which can be lumbered profitably the control measures do not involve much expense.

'The infestation of Western white pine by the Western White Pine Bark-beetle is reported from additional localities this season. If present conditions continue the white pine in many parts of British Columbia will soon be entirely killed off. The owners of any valuable stands of Western white pine should be on their guard against this most destructive enemy.

'The great loss already caused by the Bark-beetle outbreaks and the apparent certainty of still greater destruction, demand vigorous control measures in many districts. The proper disposal of pine slash is a very important factor, for the beetles frequently breed to immense numbers in such abundant supplies of breeding material and spread thence into the green timber. It should be a settled policy in British Columbia *to burn all pine slash each season between October and May*, as an aid to Bark-beetle control. The activity of other species of Bark-beetles in Spruce and Douglas fir will apparently soon render the burning of spruce and fir slash equally necessary.

'The habits of these destructive Bark-beetles and the proper measures to be taken for control of this outbreak are dealt with in a bulletin shortly to be issued by the Entomological Branch of the Department of Agriculture.

'The areas of diseased larch along the Arrow lakes, and in other parts of the Kootenays, are much less numerous and smaller in extent this season than for the last two years. Material from the affected trees was referred to Mr. H. T. Güssow, the Dominion Botanist, who reports the disease as a leaf-destroying fungus, *Lophodermium laricinum*. The majority of the trees attacked last season have recovered; but it is probable that if severe outbreaks should occur on the same areas for several years in succession, much timber would be killed, and opportunity offered for the destructive Bark-beetles to obtain a foothold in the large number of weakened trees.'

PROMINENT MEMBERS PASS AWAY.

Death has taken heavy toll of our membership during the past summer and autumn, and in some cases death came in tragic form. This was so in the case of Mr. H. H. Lyman, head of the great drug house of Lymans Limited, Montreal, who, with Mrs. Lyman, perished in the Empress of Ireland disaster. Mr. Lyman left a number of charitable bequests. Among these were: To McGill University, Lyman's Entomological Library and cases and $20,000; to aid in the establishment of a Montreal Public Library, $125,000; to the Children's Memorial Hospital, $25,000, etc., etc.

Mr. M. M. Boyd, of Bobcaygeon, Ont., died in Philadelphia, where he had gone for medical aid on June 8, in his fifty-ninth year, and was buried in the family plot in Peterboro, Ont. Mr. Boyd, along with his brother, Mr. W. T. C. Boyd, early assumed charge of the business founded by his father, the late Mossom Boyd, and in this way became acquainted with all the details of lumbering. As a practical lumberman, he always deprecated any Government policy, which, for the sake of immediate revenue, would cause a too rapid depletion of the forests. Mr. Boyd did not confine his energies to the lumber business, but took a keen interest in stock breeding, especially in the development of Polled Hereford cattle, which was carried on at the firm's ranch near Prince Albert, Saskatchewan. In fact, he was greatly interested in all that pertained to agriculture, and since his death the resolutions of sympathy passed by the different agricultural organizations show the esteem in which he was held and the value of his work.

Lieut.-Col. Jeffrey H. Burland, of Montreal, who had gone to England to head of the Canadian Red Cross organization at the front, was stricken with a fatal attack of angina pectoris on the night of Oct. 8, after being until a few hours before in his usual good health. Col. Burland, who was born in Montreal in 1861, was a member of a leading family of that city, and was prominent in many business enterprises. He was president of the British America Bank Note Company, of the Prudential Trust Company, etc. He was a generous patron of practically every hospital and charitable institution in Montreal, and, among many other benefactions, founded the King Edward Tuberculosis Institute of Montreal. He had commanded the Sixth Fusiliers of Montreal, was a member of the small arms committee under the Canadian Government, and President of the Dominion Rifle Association. He wa sone of the originators of the movement for sending a Canadian battalion to England on the occasion of Queen Victoria's diamond jubilee in 1897, and was present by invitation at the coronation of King Edward VII. and King George. Col. Burland was strongly impressed with the necessity of preserving our natural resources, and was among the earliest members of the Canadian Forestry Association. His energy and his strong personality, in addition to his wide business and social connections, made his influence felt throughout Canada, and that influence was always exerted for the benefit of his country.

TELEGRAPH POLES ALSO.

The Secretary of the High Commissioner's office in London recently interviewed the British Post Office Department in regard to purchasing telegraph poles in Canada. He was informed that whereas competition with Russia and Norway for smaller poles would probably be too keen for Canada to meet, the Department would consider the question of placing trial orders for larger size poles in Canada.

U. S. and N. Y. Timber.

In the United States as a whole four-fifths of the standing timber is privately owned, and one-fifth is owned by various states and the Federal Government. New York owns one-fifth of the forest land of the state, and one-fourth of the standing timber. Owing to a clause in the Constitution, this timber can not be cut, even though it is dying, or dead, and a menace to healthy timber about it. The state should allow careful cutting of mature timber in the Adirondacks.—*N. Y. Forest Commission Bulletin.*

Birds and Forest Protection

Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, whose work in regard to injurious forest insects is well known to all members of the Canadian Forestry Association, has always endeavored to impress upon all citizens, and particularly upon the young, through the Boy Scouts and other organizations, the value of our birds as destroyers of injurious insects and of weed seeds. In a recent address, Dr. Hewitt went into this subject in detail, and from that lecture, as it appeared in the *Ottawa Naturalist*, the following parts relating more particularly to the forest side have been taken:—

'The motives behind the widespread and increasing movement respecting the protection of our native birds may be included in two classes, namely, sentimental and practical. Most people, even in this material age, are sensible of feelings of affection towards our birds, and are delighted when the return of the first spring migrants announces the termination of our long birdless winter But the practical considerations underlying the movement are not so generally appreciated, and for that reason æsthetic feelings will be assumed and the practical motives discussed.

'Few people realize the place of insect pests in the general economy of life, but when it is understood that were it not for their controlling factors insects would, in a few years, destroy every form of vegetation, and consequently all animal life on the face of the globe, the significance of such controlling factors will be appreciated. In the United States it is estimated, on a conservative basis, that the annual loss on agricultural and forest products is about eight hundred million dollars ($800,000,000). I have estimated that in Canada, on our field crops alone, the minimum annual loss due to injurious insects cannot be less than fifty million dollars; this does not take into account the enormous aggregate cost of controlling insect pests. And yet the most valuable insecticidal agencies we have are not only not encouraged, but, in many cases, ruthlessly destroyed. Such a short-sighted and wasteful policy cannot and must not be continued.

'The quantity of insect food consumed by birds is almost incomprehensible, but the facts set forth by various investigators on this continent and in Europe give us some idea of the extent to which insects go to make up the diets of birds. Insects constitute 65 per cent. of the total yearly food of woodpeckers, 96 per cent. of that of fly-catchers, and 95 per cent. of the yearly food of wrens. Upwards of 5,000 insects have been found in a single bird's stomach. The value of the birds is increased by the fact that at the time when insects are most abundant birds are most active and require most food, especially animal food, to feed their young.

'A young crow will eat twice its weight in food; a robin weighing three ounces was found by Nash to consume five and one-half ounces of cutworms in a day. It is calculated that a pair of tits and the young they rear will consume about 170 pounds of insect food during a year. These facts and others to be given later will indicate the enormous destruction of insect life that is accomplished by the presence of birds. They constitute one of the fortunate balances of nature. But man is constantly upsetting the balance. Woodlands are cut down and give place to open fields; snake fences give way to wire; subdivisions and town lots obliterate the waste places and often the swamps. All these circumstances tend to drive away the birds formerly resident and breeding in such localities. Then outbreaks of injurious insects occur and their depredations are increased and prolonged by reason of the absence of such important enemies. Therefore, our aim should be to restore the balance by attracting the birds back to our parks and natural reservations.

'Not only do birds destroy insect pests, but they contribute to the destruction of weeds. Certain species of our native sparrows are large consumers of such weed seeds as bindweed, lamb's quarters, ragweed, amaranth, pigeon grass, etc.

'The feeding habits of a few of our common species of birds which should be protected may now be considered. The Robin (*Planesticus migratorius*) probably comes first. Early in the year it feeds extensively on cutworms, those insidious enemies of our garden plants and crops; in March they constitute over a third of the robin's food. It is accused of fruit eating, and yet of all the vegetable mater it consumes a large proportion consists

House for Winter Bird Feeding at Thirlmere, England.

of wild fruits; 330 stomachs contained 58 per cent. vegetable matter, of which 47 per cent. consisted of wild fruits and 4 per cent. cultivated fruits. The Bluebird (*Sialia sialis*) is not so common as formerly in the Ottawa district, having probably been driven away by the encroachments of man. Charming in its habits, it responds readily to encouragement, building in hollow trunks and cavities. Insects such as grasshoppers, beetles and caterpillars constitute about 68 per cent. of its food.

'With the possible exception of the house wren, probably no other birds so readily take advantage of artificial nesting places as the Chicadees (*Penthestes atricapillus* and others) and Tits. Their unremitting search for insects on every branch, twig and leaf is a fascinating sight, and the good they accomplish is difficult to conceive. A Blue Tit will destroy six and a half million insects in a year, and is bringing up a family of about twelve to sixteen young ones, about twenty-four million insects would ultimately be accounted for. Especially valuable are they in the destruction of the eggs of certain species of defoliating caterpillars, such as the canker worms and tent caterpillars, the moths of which deposit their eggs on twigs. The pupae of the codling moth and the hibernating forms of plant lice do not escape the sharp eye of these small acrobats. The little White-breasted Nuthatch (*Sitta carolinensis*) which may be seen running not only upwards, but also downwards, on the trunks of trees, has somewhat similar habits to the Chicadees. Over 50 per cent. of its food consists of insects. The House Wren (*Troglodytes aedon*) has suffered much by the inroads of the quarrelsome English sparrow, which drives it out of its nesting places on every possible occasion. Nevertheless, this confiding little bird, which charms us so

much with its little bubbling song, and exacts such a heavy toll on insect life, will gladly accept a nesting box out of which the sparrows may be kept by hanging it rather low down, and having the entrance hole as small as possible.

'The Purple Martin (*Progne subis*) formerly nested in hollow trees, but the advent of man encouraged it to nest about his domicile. In some parts of the country, I have noticed the fact, particularly in certain sections of New Brunswick, one may see martin houses erected on poles, and this form of encouragement is very successful, although the English sparrows are a constant source of trouble to the rightful owners. The value of the martins and swallows around the house and buildings as insect destroyers is appreciated by all who have encouraged them. The Tree Swallow (*Iridoprocne bicolor*), which nests in hollow trees, is not so abundant in certain sections of Ontario as formerly. Reporting the success of nesting boxes during 1913, Mr. W. E. Saunders, of London, Ont., writes: "Another lot of boxes which were put in place on an island in the Rideau Lakes were a source of actual competition among the tree swallows, there being more pairs than there were nests."

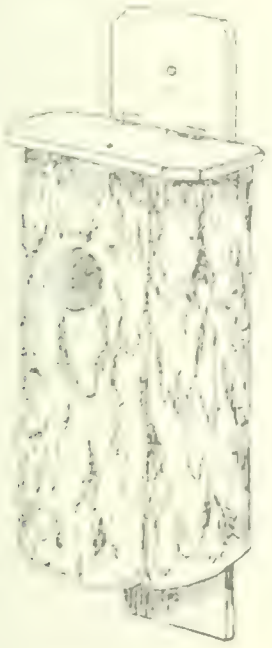
'Two of the woodpeckers may be attracted by the use of nesting boxes. The Flicker (*Colaptes auratus*), which occurs in and around Ottawa, feeds largely on ants; a single stomach has been found to contain over 5,000 ants. In another instance 28 white grubs, one of our worst pests of grass land and certain crops, were found in the stomach of a flicker, which feeds largely on the ground. It also feeds upon wild fruits, such as the wild black cherry. The Downy Woodpecker (*Dryobates pubescens*) is a most valuable ally, as it feeds largely on beetles that destroy trees by boring into the bark and timber. An examination of 723 stomachs showed that 76 per cent. of the diet was animal food, consisting chiefly of insects.

'Reference has already been made to the weed-destroying habits of our native sparrows. One of the first birds to arrive in the spring, breaking the long winter silence with its welcome little song, is the Song Sparrow (*Melospiza melodia*), which is very domestic in its habits. About three-fourths of its food consist of weed seeds and one-fourth of insects. Beetles, especially weevils, form the greater portion of the insect food. A thick hedge, dence shrubs, or piles of logs provide suitable nesting places for this most welcome of our sparrows. The Chipping Sparrow (*Spizella passerina*), whose confiding ways give it a warm place in our affection, has somewhat similar nesting habits to the former. It is, moreover, the most insectivorous of our sparrows. About 42 per cent. of its food consists of insects and spiders, and caterpillars make up the major portion of the insect food, especially when the young are being reared, when as many as 17 feedings per hour, on an average, for a brood of four nestlings have been recorded. The retiring and sombre Junco or Snowbird (*Junco hyemalis*), destroys insects and feeds on weed seeds. An examinatoin of 500 stomachs gave 23 per cent. animal food (caterpillars, bugs and beetles), and 77 per cent. vegetable food, of which over 61 per cent. consisted of weed seeds. In September the proportion of weed seeds may rise as high as 95 per cent. of the food.

'The greatest exponent of the practice of bird protection is undoubtedly Baron von Berlepsch, and to him we are indebted for the splendid example he has given at Seebach, in Germany. His ideas have been adopted by various states in Germany and in the countries where the protection of birds and the provision of nesting boxes constitute an important and necessary adjunct of forestry methods. An instance, given by Baron von Berlepsch, of the practical value of bird encouragement may be quoted. The Hainich wood, south of Eisenach, which covers several square miles, was stripped entirely bare in the spring of 1905 by the caterpillars of the Oak Leaf-roller Moth (*Tortrix viridiana*). The wood of Baron von Berlepsch, in which there had long been nesting boxes, of which there are now more than 2,000, was untouched. It actually stood out among the remaining woods like a green oasis. At a distance of a little more than a quarter of a mile further, the first traces of the plague were apparent, and at the same distance farther on still it was in full force. It was plain proof of the distance the tits and their companions had gone during the winter and after their breeding time. Similar observations were made during a plague of the same insect in the Grand Duchy of Hesse, where the protection of birds has been carried on in a sensible and energetic fashion for over ten years. Of 9,300 boxes hung up by the government in the State and Communal woods of the Grand Duchy of Hesse, 70 to 80 per cent. were occupied in the first year, and in 1907 all were inhabited. On and near Baron von Berlepsch's Seebach estate, 90 per cent. of 2,000 nest boxes in one wood were occupied, and nearly all of 500 and 2,100 in other localities. In Hungary similar measures are taken, largely owing to the admirable work of Otto Hermann, one of the foremost European advocates of bird protection.

'Some years ago, when investigating the depredations of the Larch Sawfly (*Nematus erichsonii*), in the English Lake district, I was impressed with the value of birds as natural means of control, and as birds in the worst infested district, namely, Thirlmere, were not so abundant as they should have been, it was recommended that they

should be protected and encouraged by means of nesting boxes. The corporation of the city of Manchester owns Thirlmere, this lake being their water supply, and they distributed nesting boxes of the pattern which I devised, and which is illustrated herewith. The advantage of this box was that it could be made out of the slabs or rejected outer portions of the lumber bearing the bark. Three equal lengths of the slab are nailed together to form three sides of a long box, the outside of which, bearing the bark, was round and the inside square. The fourth side is made of a flat piece of wood, forming the back of the box; this piece is longer than the other sides, and projects above and below the box, thus providing means of attaching the box to the tree. The top and bottom of the box may be made of slab wood. Several holes should be bored in the bottom, which is nailed on, to keep the nest dry. The top is hinged to the back board, and when in use is fastened down by means of a screw, which permits the lid to be opened for the purpose of cleaning out the old nests. By so utilizing waste lumber, these boxes were made very cheaply at the sawmill. In the first year (1908) 60 boxes were distributed and 31 per cent. were occupied. The number of boxes was increased yearly, until, in 1911, there were 347 boxes, of which 66 per cent. were occupied. I am informed that in 1913 75 per cent. of the boxes were occupied.



Nesting Box.

'In addition to the provision of nesting places for those birds nesting in cavities and hollow places, the protection of birds involves the carrying out of other measures also. For birds nesting on or near the ground piles of logs or brushwood may be left in sheltered places, and thickets of closely growing shrubs and vines permitted to remain here and there. Piled logs will also provide shelter for many birds during inclement weather. While most of our birds leave us during the winter, except in certain places, where the chickadees may be found, there are certain occasions where feeding may be adopted with advantage. Not infrequently after the arrival of certain of our early migrants in the spring a cold spell and snow occurs. On such occasions feeding can be resorted to with great advantage. The fact that birds require water is not so generally realized as one would wish. Especially is this the case during our hot summer months. One of the most attractive additions which can be made to a garden is a bird's drinking trough, or fountain. This should be shallow enough to permit the birds to take a bath. The best type of artificial bird water supply for a garden is a shallow pool, two or three feet in diameter, and a few inches deep, in which a few reeds and water plants are planted. If this is placed in a wooded corner of the garden or shrubbery it will be constantly visited by all kinds of small birds.

THE HOUSE OF THE TREES.

Ope your doors and take me in,
Spirit of the [illegible],
With moodlings of dusk and dew,
Clothe me in your mood.

Take me from the noisy light
To the sunless peace,
Where at midday standeth Night
Signing Toil's release.

All your dusky twilight stores
To my senses give;
Take me in and lock the doors,
Show me how to live.

Lift your leafy roof for me,
Part your yielding walls;
Let me wander lingeringly
Through your scented halls.

Ope your doors and take me in,
Spirit of the wood;
Take me—make me next of kin
To your leafy brood.

[illegible] *Westminster.*

It is stated that Professor Adam Shortt, Chairman of the Civil Service Commission of Canada, will shortly bring out a report containing some very useful information on the management and efficiency of the Civil Service of Great Britain. Dr. Shortt made an extensive investigation of the Service during a recent visit to the United Kingdom.—*Canadian Engineer.*

REINDEER HERD, purchased by the Dominion Government from Dr. Grenfell, of Labrador, and sent into the Northwest Territory as an Experiment.

IN ALGONQUIN PARK.

The following is clipped from the *Toronto Mail and Empire* and is from the pen of Mr. J. W. Johnson, M.P.P. of Belleville, Ontario. Mr. Johnson is not, we believe, directly interested in the forests, as he is an educationist not a lumberman, but he is deeply interested in them from the scenic and patriotic standpoint. This brief article shows the value of Algonquin Park, giving as it does to the busy man an opportunity of getting immediately and easily into the forest, and it also shows the strength of the appeal which the forest and forest conservation makes to every citizen interested in the welfare of his country. The article follows:—

'While the thunder of a great storm was seemingly rending the surrounding forest and the accompanying lightning was leaping across the water of the lake and finishing its pranks among the trees, I was confined to the verandah of the Highland Inn, and spent the time writing what follows:

'One sees hill rising above bluff, mountain stretching higher than hill, all having their base on the shores of deep and beautiful lakes of clear, pure, sparkling and translucent water, absolutely free from contamination or the possibility of impurity; and growing on the bluffs and hills and mountains is the primeval forest composed of such a variety of trees and underbrush that none but the forest rangers could name and classify them, and only they could name all the wild animals that range, without fear of man or gun, in every portion of Ontario's great Forest Reserve.

'Wandering through the woods, closely observing, one witnesses reforesting by nature on an extensive scale: life out of death is rising from the trunk of the rotted giant pine lying prone upon the ground, and also from its now detached bark, which, while preserving the original form and very shape and encrustation, falls into dust and ashes at the touch of the fingers. The young tree is sprouting or has attained substantial growth, its sustenance, as well as the place of its origin, being the debris and mould left by its predecessors of remote and recent years. Not the pine alone is thus recreating, but the fallen trees of every kind, notably the balsam, spruce and birch, and also the dead branches and the leaves that have lived and died during a thousand years are associated with this miracle of life from death.

'The air filters through the branches of the pine and spruce and balsam, weighs heavily on the eyelids, and gently induces, yea insists on, sleep and rest.'

With the Forest Engineers.

Canadian Society of Forest Engineers.

Mr. J. E. Rothery of Vitale & Rothery, 527 Fifth avenue, New York, has been elected a member of the C.S.F.E. Mr. Rothery has just completed the field work of a survey of the limits of the James McLaren Co. of Ottawa, covering about 2,500 sq. miles. These limits have been mapped and cruised and all information will be shown on the finished map.

Messrs. Piché & Bedard of the Quebec Government Forest Service have just issued a Bulletin No. 2, 'Etude sur les Forêts de la Province de Québec.' This is largely a compilation and shows: the forested areas by Provinces of Canada, the value of the forest products of Canada by kinds of uses to which the wood was put, the areas of forest in Quebec and how divided, Government licensed, unlicensed, privately owned, reserves, etc., a count of the whole number of trees by species on 45 acres of land, list of Government reserves, list of names of trees occurring in Quebec, scientific, French and English, total quantities of wood cut since 1871, and total revenue therefrom.

Mr. W. N. Millar has taken the Professorship made vacant by the resignation of Mr. A. H. D. Ross at the University of Toronto.

Mr. Ellwood Wilson has finished the survey of 2,500 sq. miles for the Laurentide Company, Limited, showing the watercourses, roads, trails, boundary lines, telephone lines, etc., also timber conditions, burns, cut over areas, etc. This survey was built up on closed traverses with an average error of closure of 1:300. Some reindeer have also been imported from Newfoundland and will be trained to take the place of sled dogs.

Faculty of Forestry University of Toronto.

Registration in the Faculty has now filled up the ranks of students to practically the same number as last year, namely 50. Of this number 20 are newcomers, precisely the same number as entered last year. Just half of last year's freshman class did not return for various reasons, four having enlisted.

The students of the third and fourth years went into practice camp at the beginning of the term under the guidance of Professors Millar and Howe. The camp is located in Vernon township, north of Nairn and west of Sudbury, where the Graves, Bigwood Company is operating. The men returned on Oct. 29, having had an unusually successful campaign on the usual lines.

Professor Willis N. Millar, formerly inspector of Forest Reserves in the Dominion Forestry Branch at Calgary, takes the place of Mr. A. H. D. Ross as lecturer on Mensuration, Utilization and Protection. He comes with a wide practical experience both in the United States and Canada.

Dr. Howe was employed during the summer on reproduction studies in British Columbia for the Commission of Conservation, and will presently have interesting data for publication on that score.

New Brunswick Forestry School.

The war does not seem to have materially affected the Forestry Department of the University of New Brunswick and the classes, with the exception of the freshman are larger than usual. There are four seniors, twelve juniors, twelve or more sophomores, and three freshmen, besides a few men taking the combined five-year course in Forestry and Engineering.

During the past summer the majority of the students were engaged in forestry work. Five juniors spent a profitable summer with the Dominion Forestry Branch. These were Messrs. Vavasour, Holman, Hipwell, Ketchum and McGibbon. Of the sophomores, Messrs. Gibson, Webb, Miller, Jewett, Armstrong, Townsend and Barnes were with the New Brunswick Land Company, and Messrs. Jago, Maimann, Atkinson and Horncastle with Rothery & Vitale in Quebec. Maurice Williams, another sophomore, spent the summer with the St. John Log Driving Company, while some of the others were engaged in engineering work or attended the military camp at Sussex, N.B.

H. C. Belyea, of the class of 1911, is at Yale Forest School specializing in silviculture and finishing his M. F. degree.

Field work will be carried on until Christmas on the tract of land belonging to the university, the juniors and sopho-

mores being given assigned work in mensuration and silviculture. Later they will assist in carrying out a lumbering and wood-cutting operation, and will be given some experience in marking timber for cutting. The seniors are pursuing courses in wood structures and lumbering, and are making a topographical survey of the university grounds. The juniors are also required to take railway construction and do field work in laying out curves and spirals with the engineering students.

The college is pleased with the record its students are making. In British Columbia three of them are District Foresters, Messrs. Caverhill, Murray and Prince.

Dominion Forestry Branch Notes.

Mr. A. B. Connell, Forest Assistant, has completed his survey of the Pelican Mountain district, Saskatchewan, and has taken up his work as Forest Assistant in connection with the office of the District Inspector, Prince Albert, Sask. Mr. H. A. Parker, who was engaged as Mr. Connell's assistant, has been transferred to the Lesser Slave Forest Reserve.

Mr. A. V. Gilbert, student assistant in charge of Saskatchewan Survey No. 1, has returned to college, as has also his assistant, Mr. D. Greig.

Mr. J. B. Hipwell, student assistant to the Timber Berth Survey party, which operated in connection with Crowsnest and Clearwater Forest Reserves, has resumed his studies at college.

Forest Assistant G. S. Smith, who had charge of Saskatchewan Survey Party No. 2, has returned east and will finish his reports at head office, Ottawa. His assistant, Mr. Hughson, has returned to college.

Mr. K. Vavasour, of the University of New Brunswick, Fredericton, who had charge of Saskatchewan Survey No. 3, has returned to college. His assistant, Mr. G. M. Dallyn, has returned to Toronto University Forest School.

Mr. E. B. Prowd and assistant, Mr. H. A. Porteous, who were surveying in Eastern Manitoba, have returned to their studies at Toronto University Forest School.

Messrs. A. M. Thurston, J. F. L. Hughes, R. A. R. Campbell, and C. R. Mills, who were engaged in reconnaissance work in British Columbia, have returned to college.

Student Assistant T. F. Rance, who had charge of the Cold Lake Survey party, has returned to college, along with his assistant, Mr. F. J. McGibbon.

Mr. C. H. Morse, who has been Acting Forest Supervisor of the Clearwater Forest Reserve, returned to Toronto Forest School late in October.

FOREST PRODUCTS LABORATORY MOVES.

The Dominion Forestry Branch Forest Products Laboratory at McGill University, Montreal, has moved from the old medical building to the Molson building fronting on University street. Mr. J. S. Bates, the chief of the Laboratory staff, has returned from North Carolina where he investigated the possibilities of the distillation of British Columbia yellow pine. The work of the laboratory in the different lines of investigation will go forward more rapidly now that the removal in contemplation for some time has been effected.

PIT PROPS FOR GREAT BRITAIN.

The closing of the usual sources of supply by the war has caused an enquiry from Great Britain for pit props and mining timber generally. The British Board of Trade sent out a commission, which visited Ottawa and various points in the Maritime Provinces, with a view to obtaining figures as to cost and shipping facilities The Commission was composed of the following gentlemen: Messrs. W. Windham, representing the Board of Trade; David Harrower and Norman Cumming, representing the Federated Timber Trades; Ridley Warham and Mr. Warrington, representing the Federated Collieries, and R. Sommers, Secretary. In Ottawa they visited the Department of Trade and Commerce and the Dominion Forestry Branch. At the latter they were able to secure considerable definite information, as, in addition to the general statistics collected, the Branch has had, during the past season, an experienced mining engineer, Mr. J. W. McLeod, assisted by Mr. B. R. Morton, one of the technical officers of the Branch, working on this matter in Nova Scotia. The British Commissioners were not authorized to make contracts, but were to spy out the land, and it is likely that if a connection can be established this trade will become permanent. Certain sections of the Maritime Provinces seem well adapted to the growing of pit props, and it was this, coupled with the desire of Canadian mine owners to know how they were likely to be situated for the future, which led the Forestry Branch to undertake this special investigation, the results of which will doubtless be available shortly.

The Department of Lands and Forests, Quebec, on October 20, offered for sale by public auction a number of permits to cut timber in certain districts. The average price obtained was $238 per square mile, permits for 1,036 square miles being sold.

Canadian Forestry Association

THE Canadian Forestry Association is an independent organization of patriotic citizens, which has for its object the highest development of the soil and resources of Canada by urging governments, municipalities and owners generally to devote each acre to that for which it is best suited, and particularly to keep under forest those soils fitted only to grow trees.

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BACK THEM UP.

At last what believers in forest conservation have asked for so long has happened—a man has been sent to jail for three months for leaving fire in a forest. Forest protection is as much a moral question as it is a political or administrative question. The public has for a long time believed that stealing a ham or setting fire to a woodshed were crimes for which the perpetrator should be sent to jail, but that to send a man to jail for setting fire to a forest was a cruel and brutal thing to do. This was so, though the burned woodshed might be worth $50 and the burned forest worth $50,000, true also in spite of the fact that homes and even lives might be endangered by the forest fire. It is only lately that the public conscience has been sufficiently aroused to agree that it is proper to fine men for burning down forests,

FACULTY OF FORESTRY
DEC 7 1914

but few hoped to live long enough to see the day when a man would really be sent to jail for setting forest fires.

Now it has happened. The Lower Ottawa Forest Protective Association has had a good many men fined for setting fire to their slashings to clear off their farms, contrary to law, at a time which endangered the surrounding forests. But the Association found that many of those fined considered that the more trees burned the more land cleared, and that a fine was a small price to pay for clearing their own farms—no matter what happened to the adjoining forest. It was, therefore, decided to press the matter, and as a result the delinquent was convicted and sent to jail for three months.

We do not present this in any vindictive spirit. We are sorry for the man who has had to go to jail. But if Canadian forests are to be saved somebody had to begin the unpleasant business of teaching men that arson is punishable whether in town or in the forest. In the past individual timber owners have hesitated to prosecute because of the attitude of public opinion, and because of the fear of retaliation by more fire upon their particular holdings. Now the union of owners known as the Lower Ottawa Forest Protective Association has acted, and it is the duty of every good citizen to give them their countenance and support. This is not a matter which concerns the Lower Ottawa or the Province of Quebec alone; it concerns every township in Canada where there is standing timber, nay, it concerns every part of Canada in which there is a man, woman or child. This indifference to forest fires and to the incendiaries who start them has been one of the scandals of North American civilization.

This is not a case of vindicating the rights of private property as against the rights of the citizen. The timber that is burned does not, in the ultimate analysis, belong to any individual or corporation. It belongs to the people of Canada. Whatever the lumbermen get out of it the public get at least three times as much. In spite of this the Lower Ottawa Forest Protective Association will be subjected to much criticism by the people with whom they have to deal, and, possibly, to recrimination. It is the duty of all Canadians to support the Association and to endeavour to bring public opinion into the right attitude on this question. Until public opinion is right no army of fire rangers, however large, or however well organized, will protect our Canadian forests from their great enemy

---

A NOVA SCOTIA OPPORTUNITY.

The Maritime Farmer, in a recent issue, refers to the natural park in connection with the Dominion Experimental Fruit Station at Kentville, Nova Scotia, and to the value of this park to the people of the province. The Kentville Station embraces about three hundred acres of land, of which nearly one-half is in the form of a deep glen, the sides of which are covered with virgin timber of large growth. In urging the selection of this site for the station, the committee of the Fruit Growers' Association appear to have taken into consideration that this was one of the few remaining pieces of primeval forest readily accessible to the people. The idea was a very good one, but fruit growing and forestry are different businesses, and it is doubtful if those in charge of the station know just what to do in order to protect and handle the forest to the best advantage. At cretain seasons the tract is liable to be endangered by fire, and what to do with a forest to get the best results does not fall within the training of a horticulturist. It would be a good thing if some arrangement could be arrived at whereby the Department of Agriculture could avail itself of the tech-

nical knowledge of the officers of the Forestry Branch of the Department of the Interior in this matter, as this piece of primeval Nova Scotia timber is not only well worth preserving from a scenic and historic standpoint, but could also be made of great use as a demonstration station to assist the owners of Nova Scotia timber in handling their forests.

PURE MAPLE SUGAR.

A member of the Canadian Forestry Association has called attention to the fact that grocers are still selling compound maple syrup and sugar, that is, syrup and sugar in which there are other ingredients than the pure product of the maple tree. He also states that some of the grocers do not seem to be aware that there has been any change in the law. In reply, it may be stated that the new law, passed last session, does not go into force until January 1, 1915. This was done in order that all the old stocks of the compound maple sugar and syrup might be disposed of before the explicit provisions of the new law went into force. After the new year it will be well for our members to take note of this fact, and in case of infraction of the law call attention to the severe penalties. In Canada, for some years, it has been possible to get butter and honey without any fear that a compound article was being sold under these names, and there is no reason why there should not be the same safeguard in the case of maple syrup and sugar.

THE FOOL WITH AN AXE.

Farm Journal.

It took old Nature some fifty years
To give a tree its majesty and power,
And now some fool with an axe appears
And cuts it down in a short half hour.

MAKING THE DESERT BLOSSOM.

All of us remember many pictures of the coast of the Landes in France, with the sand dunes interposed with marshes and shepherds going about on stilts. Landes still exists, but through the energy of the French forest service the desert has been abolished and the district turned into a productive part of France. Though Mr. R. H. Campbell, Dominion Director of Forestry, was not able to complete his projected tour of European forests, he was able to visit southwestern France to see the district of the Landes. The country a century ago consisted of sand dunes for a long distance back from the sea with marshes lying between the dunes. Seventy-five years ago the French Government began to reforest this district. To-day it is covered with timber in all stages of growth, and while it was originally planted, reforestation is now secured by natural regeneration by following good cutting methods. The exposure to wind is too great to permit the growth of trees on the dune nearest the sea and this is covered with beach grass to hold the sand. The next row of dunes is covered with trees stunted and bent inland by the wind, but inland from that good straight timber is grown. The outer dunes are never deforested but inland clean cutting is practised. The prevailing tree is the maritime pine. The fixing of the sands has allowed agriculture to be carried on where previously it was impossible. As an evidence of increased prosperity caused by the foresting of the country Mr. Campbell noted one parish, among others, which before planting began had a population of 1,600 and which now has a population of 14,000. The picturesque shepherds on stilts have disappeared, but forests and prosperity have come in their place.

The Land and Forest Department of Ireland has applied to the Chief Forester of British Columbia for seed of British Columbia fir and spruce. These will be used in reforestation work in Ireland.

Jack pine trees planted ten years ago in the sand hills of Nebraska are now large enough to produce fence posts. Last year the first seed was gathered from this plantation.

The New York state forest nurseries have a capacity of twenty-eight million young trees a year.

Dominion Forestry Branch Work.

Salient Points from the Report of the Dominion Director of Forestry for 1913

The Forestry Branch of the Department of the Interior, Canada, has charge of all the forest reserves in the three prairie provinces of Manitoba, Saskatchewan and Alberta and in the Railway Belt in British Columbia. This latter is a strip of land forty miles wide, twenty miles on each side of the main line of the Canadian Pacific Railway deeded to the Dominion by the Province of British Columbia when the province joined the Confederation of the Canadian Provinces. The work has now grown very large, and the report makes a volume of 136 pages. This report covers the calendar year 1912, and its contents will, perhaps, be best understood by giving the leading points of the report of the Director, Mr. R. H. Campbell, supplemented by points from the reports of his assistants. These follow:

Appropriations.

Total appropriation for fiscal year 1912-13, $362,500; among the chief items were:

Management of Forest Reserves, $169,000.
Fire Ranging,, $99,000.
Tree Planting, $49,500.
Forest Surveys, $13,000.

The revenue from settlers' permits to cut timber and hay, and for grazing, was $23,000.

Note.—It should be noted that another Branch of the Department of the Interior collects the revenue from licensed berths outside the Forest Reserves, and from berths inside the Reserves which were licensed prior to the establishment of the reserve system. The collections of this branch, the Timber and Grazing Branch, for the year 1912 *were* $434,000.

Statistics.

One of the important duties of the Dominion Forestry Branch is the collecting and publishing of timber and forest products statistics for the whole Dominion. The figures for 1912 are:

Lumber, lath and shingles	$ 84,000,000
Firewood	50,000,000
Pulpwood	12,000,000
Posts and rails	10,000,000
Cross-ties	8,000,000
Square timber exported	1,900,000
Cooperage	1,700,000
Poles	1,200,000
Logs exported	1,100,000
Tanning material	1,000,000
Round mining timber	600,000
Miscellaneous exports	300,000
Miscellaneous products	10,500,000
Total	$172,300,000

Tree Planting.

In 1900 the Forestry Branch inaugurated the plan of supplying tree cuttings and tree seedlings free to prairie farmers, on condition of their paying the express charges and preparing and cultivating the soil of the plantations. This work has grown so that a second nursery station, in addition to the main station at Indian Head, Saskatchewan, has been opened near Saskatoon.

Trees distributed to settlers in 1912, 2,729,135.

Number of applicants receiving trees, 3,618.

Total number of trees distributed since establishment of the nursery station, 21,650,660

Note.—The United States Forest Service after examining the Canadian system of distribution of trees to settlers has decided to adopt it.

Forest Reserves.

Organization. Reserves are divided into four districts with an inspector over each. Three of these districts correspond with the provinces of Manitoba, Saskatchewan and Alberta, and the fourth comprises the Railway Belt in British Columbia.

Permanent officers: District inspectors, 4; supervisors, 12; forest assistants, 4; forest rangers, 46.

Area of Dominion Forest Reserves and Parks was in 1912 25,201 sq. miles, divided as follows: Alberta, 18,564; Saskatchewan, 937 sq. miles; Manitoba, 3,585 sq. miles; British Columbia, 2,115.

Note.—These figures have increased in 1913 *and* 1914 *until now the total area in forest reserves and parks is* 43,802 *sq. miles, as follows: Alberta,* 26,271; *Saskatchewan,* 9,681; *Manitoba,* 4,027; *and Brtish Columbia* 3,778.

The improvements on the reserves for the year were: ranger houses built, 10; stables,

191; bridges built, 10; fire guards cleared, erected, 100 miles.

The exploration of public lands to determine those which are non-agricultural and therefore fit to be included in forest reserves was continued by seven parties. This covered all the provinces from Manitoba westward, and special attention was given to the survey in advance of settlement in the Peace River country.

HON. W. J. ROCHE,
Minister of the Interior.

Outside of the forest reserves in the Prairie Provinces the fire ranging was placed in charge of one inspector. In British Columbia it was under the charge of the district inspector. There were 12 fire ranging districts, covering the following territory: Southern and Northern Manitoba, The Pas, East and West Prince Albert, Battleford, Edmonton, Great Slave Lake, Mackenzie, Revelstoke, Salmon Arm and the British Columbia Coast. On these there were a total of 202 rangers in the season in addition to the force on the forest reserves already enumerated.

Fire patrol along railways was carried on by the Forestry Branch in conjunction with the Dominion Board of Railway Commissioners, the railways furnishing patrols and

FIRES.

The fire record for the season was very satisfactory, only one important fire occurred result of a spark from a logging engine.

The patrol of the country in which the wood bison are located was continued and numbers of the bison were seen. It is estimated that they number between 200 and 300. Practically the last remaining herd of bison or buffalo, living in a wild state, is this herd, which is located near Fort Smith on the Slave river, and between Lake Athabasca and Great Slave lake. These are a variety of the prairie buffalo which have adapted themselves to life in a timbered country.

Copies of this Report may be had free on application to the Secretary of Canada, Ottawa.

THE SOLITARY WOODMAN.

All day long he wanders wide
With the gray moss for his guide,
And his lonely axe-stroke startles
The expectant forest side.

Toward the quiet close of day,
Back to camp he takes his way,
And about his sober footsteps
Unafraid the squirrels play.

On his roof the red leaf falls,
At his door the bluejay calls,
And he hears the woodmice hurry
Up and down his rough log walls.

Hears the laughter of the loon
Thrill the dying afternoon,—
Hears the calling of the moose
Echo to the early morn.

—Charles G. D. Roberts.

KEEP PEGGING AWAY.

A Toronto member writes: I sympathize with you in the uphill work which you must find in attracting attention to a matter which is naturally overshadowed by the catastrophe in Europe, but the work done by the Association in connection with forestry is more appreciated than you, probably, are aware.

Approximately 750 acres on the Oregon national forest were planted with young trees this spring.

Douglas—The Man and the Tree

Romantic Life of the Man After Whom the Douglas Fir Was Named.

Douglas was the family name of Lord Selkirk, founder of the Red River Settlement, and it was the name of other men who have been prominent in Western Canada, so that considerable doubt exists in the popular mind as to the particular man after whom the famous Douglas fir was named. It is found that it was not named after a founder, governor, or chief justice, but after a remarkable man in a humbler sphere of life. It should also be noted, too, that while the name of Douglas will always be associated with the common name of this magnificent tree, yet the scientific name fails to show any connection. It is called scientifically *Pseudotsuga*, literally, false hemlock. It is not false hemlock, and it is a much finer tree than any hemlock, and it is to be hoped that a later generation of botanists will change the name and give Douglas a place in it.

Regarding Douglas, Dr. Charles S. Sargent, Director of Arnold Arboretum at Harvard University, has this to say of him in a footnote in his famous work 'Silva of North America':—

'David Douglas (1798-1834), a Scotch gardener sent by the Horticultural Society of London to explore the forests of the Northwest Territory, is, from his courage, energy and success in the presence of great difficulties and dangers, and from his untimely and horrible death, a conspicuous figure in the annals of American botanical exploration. Douglis, who had been trained by Sir William Hooker, and had made a short botanical journey in eastern America in 1823, was sent, in 1824, by way of Cape Horn, to the Columbia River, where he arrived in April, 1825. He spent two years in Oregon, discovering some important trees, including *Abies nobilis* (noble fir), *Abies amabilis* (lowland fir), and *Pinus Lambertiana* (sugar pine), the largest of its race.

'In March, 1827, Douglas started from Fort Vancouver, on the Columbia River, crossed the continent by Hudson's Bay

Among the Big Trees that Douglas Discovered on the Pacific Coast.

Company ports, and collected for England, which he reached in October of the same year. Two years later he left England for the last time, and reached the mouth of the Columbia on June 3, 1830, remaining in Oregon until the autumn, when he sailed for Monterey. Here he remained until the next summer, discovering no less than a hundred and fifty species of undescribed plants, and then sailed for the Sandwich Islands. In the autumn of this year he returned to the Columbia River, and in the following summer extended his exploration as far north as the Fraser River, in which he was wrecked, losing his collections and instruments, and barely escaping with his life. But the beauties of tropical vegetation lured him from the awful solitude of the sombre fir forests of the northwest, and in October, 1833, he sailed again for the Sandwich Islands. Here he passed the winter, and on the 12th of July, 1834, while engaged in exploring the high peaks of the island, he fell into a pit in which a wild bull had been captured, terribly mangled.

'Douglas is said to have introduced two hundred and seventeen species of plants into English gardens, the list including many valuable and beautiful trees, like the Redwood, the Sugar Pine, and the Douglas Fir. No other collector has ever reaped such a harvest in America, or associated his name with so many useful plants. By an unfortunate hazard of fate the noble Douglas Fir, the most important timber-tree introduced by Douglas, and one of the most valuable trees in the world, does not, as might well have been the case, perpetuate his name in the language of science, and it is a humble primrose-like alpine herb which commemorates this explorer of forests and discoverer of mighty trees.'

Algonquin Park, Live Beaver in a Trap.

Animals in Algonquin Park

Algonquin Park is the property of the people of the Province of Ontario, and lies in the heart of the province between the rich farm land of the southern border along Lake Ontario and the great clay belt, now being opened to settlement on the slope into James Bay. The south-western corner of the park is about 150 miles north of the City of Toronto. It contains 1,750,000 acres, and is roughly a square of a little over fifty miles a side. A number of cutting licenses existed in the park when it was set aside as a provincial park and game refuge eighteen years ago. Some of the licenses have been bought out and some remain. The shooting and trapping of game has been prohibited, with the result that the numbers of game animals have very greatly increased.

The park, occupying a watershed, contains within it the source of a number of important rivers and streams, which fertilize the surrounding lands. In the same way this game refuge has become a reservoir of game from which the deer and other animals spread out into the surrounding part of the highlands of Ontario, greatly improving the sport in those parts of

the province where hunting is allowed.

The game refuge side of the work has been so successful that the park is in some respects overstocked with game animals, and these can now be taken in considerable numbers from year to year, without endangering the park as a source of supply and without diminishing the number below a safe point. It was first suggested that the Ontario Government would conduct a great fur farm and trap about 1,000 beavers per year, selling the skins. This is done to a considerable extent. But the growth of fur farming and the demand from zoological gardens for live animals has made it more profitable to catch the animals alive.

Taking Out a Live Beaver.

Various expedients were devised for this, and the most successful is a cage trap invented by Mr. James Bartlett, son of Mr. G. W. Bartlett, who has been Superintendent of the Park for the past seventeen years. This trap is like an old-fashioned valise or carpet bag, with sides made of chains. The animal steps on the baited spring and the trap closes around it, without hurting it, and at the same time holding it securely. In the case of beaver, and other aquatic animals, the trap is set under water, but in such shallow water that when sprung the top of the chain bag will be above water, so that the animal can get its nose out to breathe. The general plan of these traps will be seen in the engravings shown herewith. It is interesting to know that since this trap has been used very few animals have been caught only part way in it and killed, while, on the other hand, two animals have been caught alive at one time. The beaver and other animals, after being caught, are fed in a place properly protected until ready for shipping, when they are shipped in the boxes covered with wire netting, shown in one of the engravings.

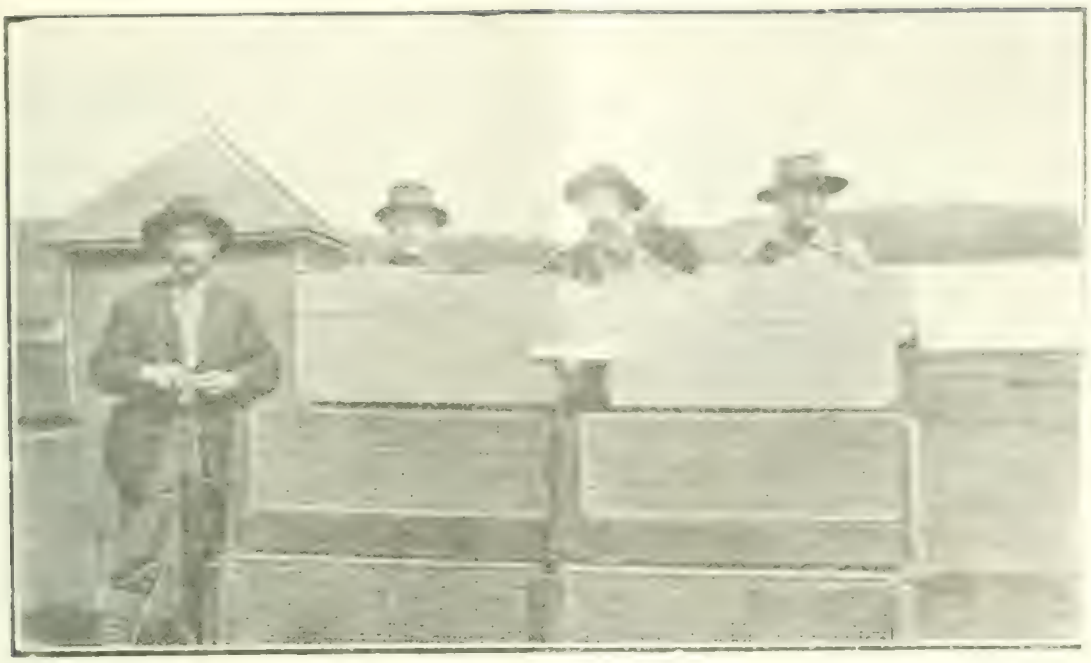
Beaver skins, when sold in quantities, average around $10 per pelt, but the live beaver bring much more. If you think of starting a fur farm, or keeping some pet fur-bearing animals, you can be supplied by the Ontario Government from Algonquin Park at the following rates per pair: Mink, $35; beaver, $50; martin, $80; fisher, $150; otter, $150.

OBITUARY.

Death has again been busy in the ranks of those who have taken an active part in forest conservation.

After a long illness, Hon. Colin H. Campbell, former Minister of Public Works and Attorney General of Manitoba, died at his residence in Winnipeg. Mr. Campbell attended the Canadian Forestry Convention at Victoria as the representative of the Province of Manitoba, and was so much impressed with the need of active measures of forest conservation that he was the inspirer of the invitation from the Government of Manitoba to hold the 1913 Forestry Convention in Winnipeg. Unfortunately, before the convention was held, Mr. Campbell suffered from a paralytic stroke, which was the beginning of the illness which caused his death. He was away in Europe when the convention was held, and was never able to again take part in public affairs.

Mr. D. R. Wilkie, President and General Manager of the Imperial Bank of Canada, who, for a number of years, had been a warm supporter of forest conservation, died after a brief illness at his residence in Toronto, on Nov. 16. Mr. Wilkie was a Canadian by birth, a native of the city of Quebec, and had spent all his business life in Canadian financial institutions. He was made general manager of the Imperial Bank upon its incorporation, and retained that post until the time of his death, which was wholly unexpected. About eight years ago he was made president as well as general manager. For the past eight or ten years Mr. Wilkie had taken a personal interest in forest conservation, believing that much of Canada's prosperity depended upon the way she dealt with her natural resources.



Live Animals Ready for Shipment from Algonquin Park.

One of the best known residents of the Ottawa Valley, Mr. John Gillies, of Braeside, member of the well known and extensive lumber firm of Gillies Brothers, died suddenly at Pembroke, Ontario, on Nov. 17. Mr. Gillies was a son of the late John Gillies, founder of the firm, and brother of Mr. David Gillies, ex-M.P.P. of Carleton Place, Ontario. The late Mr. Gillies specially devoted himself to the woods department of the firm's business, and, like other members of the firm, was impressed with the inadequate care Canadians have been taking of their timber wealth. Everybody will recall, at the opening of the Cobalt boom, the struggle there was on the part of prospectors and miners to get the 'Gillies Limit' thrown open to prospectors, careless of the results to the valuable timber on the limit. This was one of the firm's extensive holdings in Northern Ontario, in regard to the rapid clearing off of which for prospecting purposes Mr. Gillies held strong views. He will be greatly missed throughout the Ottawa Valley where he was favorably known to everyone who was in any way interested in our forests.

The total amount of land purchased in the Eastern states for federal forests is nearly 800,000 acres. So far the principal work on these areas has involved their protection against forest fires.

Let us remember that the conservation of our natural resources, though the greatest problem of today, is yet but part of another and greater problem—the problem of national efficiency. — Ex-President Roosevelt.

SEEKING SUBSTITUTES FOR SPRUCE.

Pulp and paper men in Montreal have been much interested in an announcement from Washington, published in the daily papers, to the effect that the United States Government wood pulp laboratory at Wausau, Wis., is making experiments with a view to finding a substitute for spruce in the making of wood pulp for newsprint. Experiments along the same lines are being made in the Canadian Government laboratory at Montreal, as Canada has immense supplies of other timber, which might be utilized for the purpose if a suitable treatment could be discovered. It is pointed out that with the increasing consumption of newsprint in Canada, together with the ever-increasing demand from the United States, it will sooner or later be necessary to utilize other woods. The newspaper with a circulation of 60,000 of 20 pages every day uses the product of four acres of forest per diem. When the figure is multiplied by the great number of papers printed on this continent, it will be seen that the drain on forests is enormous.—Paper Trade Journal.

The Government of Quebec has increased the grant to the Forestry School affiliated with Laval University, Quebec, from $5,000 to $8,000 per year. The course of studies will be considerably increased.

The future well-being of Canada depends on the loyal acceptance by the people of the principles which aim at the profitable and scientific development and conservation of her natural resources.—Earl Grey.

Notes of Forestry Progress

Mr. J. Fraser Gregory, of St. John, N.B., was one of those who gave evidence before the Dominions' Royal Commission on Imperial Trade Relations before the work of that body was postponed because of the war. Mr. Gregory, who is an authority on lumber conditions, confined himself entirely to that subject, discussing the rate of tree growth, timber leases, the deterioration of the forests through the coming in of inferior species of trees, and the driving difficulties on the St. John River owing to its international character. The work of this Commission, which will be of great benefit to the Empire, will, it is expected, be resumed as soon as war is over.

Mr. F. E. Buck, B.S.A., assistant to the Dominion Horticulturist, is the author of Bulletin No. 19, on the 'Planting and Care of Shade Trees.' The bulletin deals with planting methods, what trees to plant, rapidity of tree growth, hints on selecting trees, distances apart to plant, ornamental trees, wind-breaks, care of trees, pruning, injuries to trees, how to protect trees, with general suggestions as to the system of planting trees in cities. The bulletin may be had free by those desiring it by addressing the Department of Agriculture, Ottawa, Ont.

The New Brunswick Government has decided to suspend during the war that provision of the law which prohibits the exportation of timber for pulp purposes cut on the Crown lands of the province, so far as it relates to Great Britain. This will allow pulpwood and pit props cut on Crown lands to be shipped to Great Britain.

Human carelessness was responsible for 75 per cent. of the forest fires in District No. 1 of the United States Forest Service, which includes Montana and Northern Idaho. The percentage is high, but probably is about a fair average in districts where the population is comparatively dense. The ordinary man rarely gives a thought to what may happen when he leaves a camp fire alight, or throws a burning match away.

The forestry movement in Pennsylvania owes much to the women of the State who were active in its organization, and have been its firm support individually and through their clubs and federation, and a number have been liberal contributors to the support of the association.

The British Columbia Forestry Branch, in addition to interesting woodsmen, and all who live near the woods in forest protection by the distribution of unique posters and useful articles which suggest carefulness, has sent out to members of the Boy Scouts one thousand pocket whetstones, which bear this motto: 'Build camp fires in safe places. When you leave put them out. Boy Scouts be prepared. Help protect our forests.'

The Canadian Engineer notes that the mines and metallurgical plants of northern Ontario are now for the most part operated by water powers, and that these powers have been of the greatest service in providing cheap motive force. Everybody knows that the permanence of these powers depends upon forest being maintained upon the headwaters of the streams, which is a reason added to that of our need for timber for protecting our northern Ontario forests.

A writer in the Toronto *Weekly Sun* notes that the farm in Halton County, Ontario, on which Honourable W. T. White, Minister of Finance, was born, was originally covered with some of the finest pine that grew on this continent. Mr. James Lyall White, son of the original settler, was afterwards a leading lumberman in Michigan, and he stated that never in all his experience as a lumberman did he see finer pine than that which grew on the old homestead.

In a recent address, Hon. W. H. Hearst, Prime Minister of Ontario, pointed out that the capital invested in lumber interests in the province was $260,000,000. The wages paid amounted to $39,000,000, and $2,500,000 worth of farm products went into the lumber camps as supplies. The Government and lumbermen between them spent $325,000 on fire protection in 1913.

In some parts of the United States native birds have begun to increase in numbers after having reached a very low ebb. This change is attributed to the dissemination of information by bird lovers and bird societies as to the great work done by birds in protecting farm crops and forests.

A movement has been on foot for some time in the United States looking to the formation of a treaty between the United States and Canada for the better protection of migratory birds passing back and forth between the two countries.

PULPWOOD PRODUCTION FOR 1913.

Bulletin No. 46 of the Forestry Branch of the Department of the Interior, Canada, 'Pulpwood Consumption in 1913,' compiled by R. G. Lewis, B.Sc.F., assisted by W. Gay H. Boyce, has just been issued. It shows that in 1913 there was consumed in Canadian mills 1,109,034 cords of pulpwood, valued at $7,235,198, and that there was exported 1,035,030 cords, valued at $7,070,571. The quantity consumed in Canadian mills was an increase of 28.1 per cent. over that of 1912. The average cost of pulpwood at the mill in Canada was $6.53, an increase of 8.5 per cent. over 1912. The provinces produced pulpwood in the following order: Quebec, Ontario, British Columbia, New Brunswick, Nova Scotia.

Only five kinds of wood were used in the manufacture of pulp in the following proportions: Spruce, 68.1 per cent.; balsam fir, 25.5; hemlock, 4.3; jack pine, 1.7, and poplar, .4 per cent.

As to the methods of making pulp, these consumed wood in the following proportions: Mechanical ground wood, 54.1 per cent.; sulphite pulp, 33.3; sulphate pulp, 12.3. Soda pulp has greatly reduced, only 5,144 cords being used for this purpose in 1913.

Copies of this Bulletin may be had free on application to the Director of Forestry, Ottawa.

IMPORTATION OF PINE SEEDLINGS PROHIBITED.

Dr. H. T. Gussow, Dominion Botanist, Department of Agriculture, Ottawa, supplements his previous information on the subject of legislation concerning White Pine Blister Rust by a note calling attention to the fact that on Nov. 9, 1914, an Order-in-Council was passed by the Government of Canada at Ottawa as follows: 'The importation into Canada of the following species of the genus Pinus and their horticultural varieties, viz: White pine (*Pinus strobus L.*), western white pine (*Pinus monticola Dougl.*), sugar pine (*Pinus Lambertiana Dougl.*), stone or cembran pine (*Pinus cembra L.*), and all other five-leaved species of the genus Pinus is prohibited.'

A USEFUL HANDBOOK.

The Dominion Parks Branch has issued a 'Handbook of the Rocky Mountains Park Museum,' prepared by Mr. Harlan I. Smith. The book, which is a volume of 126 pages, is an effort to make the museum at Banff more useful, and this is done by making the handbook as non-technical and as interesting to the layman as possible. The attempt is made to link up the information contained in the museum with the fund of knowledge that every man has, so that [illegible] by adding to and systematizing his knowledge without having to put [illegible] already known and [illegible] Those who are interested in the museum, with the preparation of books with a similar purpose, may obtain a copy free upon applying to the Commissioner of Dominion Parks, Department of the Interior, Ottawa.

Storms Never Bother This Farmer.

Mr. Wm. Wightman, Glengarry Co., Ont., hardly knows when there is a storm raging, so thoroughly are his house and buildings protected by windbreaks. The windbreak here shown is 50 or 60 feet across, there being several rows of trees.—Photo by courtesy of *Farm and Dairy*.

THINK OF THE FUTURE.

'Let us think of the future. We are trustees for the future. We are not here for ourselves alone. All these gifts were not given to us to be used by one generation, or with the thought of one generation only before our minds. We are the heirs of those who have gone before, and charged with the duty we owe to those who come after.'—*Rt. Hon. James Bryce.*

FISH AND FORESTS.

The Government of Canada, with the idea of leading to a fuller utilization of our food products, has issued two books, one dealing with the cooking of apples, which may be obtained free through the Department of Trade and Commerce, and another pamphlet on 'Fish and How to Cook it,' issued by the Department of the Naval Service, Ottawa, copies of which may also be had free upon application to that Department. Foresters are interested in the latter subject from the fact that barren and burned over territory has no fish in its streams. If we are to have tourists we must have green woods for them to come to, otherwise there will be

neither game nor fish. Both subjects interest the friends of conservation from the fact that both apples and fish, in their sale and transportation, require considerable quantities of timber for the manufacture of barrels and boxes. We are beginning to see, however we look at it, that our forest wealth plays a large part of our national life.

OLD WAYS AND NEW.

One of our oldest members, Mr. R. J. Drummond, of Perth, Ont., writes that he recollects, as a boy in Ottawa, when Sparks street was a green common, seeing the men pass with cant hooks and other tools to repair the cribs at the foot of the locks of the Rideau Canal. In those days timber prices were low and the waste in the woods great. Every September the people of Bytown (Ottawa) and surrounding towns suffered from sore eyes from the presence of so many bush fires. Great improvements have been made, but more still remains undone, and Mr. Drummond urges greater activity, with a Dominion minister and department devoted exclusively to forests.

DESTRUCTIVE PEACE.

Forests have been ravished in Europe and towns and villages destroyed by men with a deliberate purpose, and the world stands aghast at the wantonness. But in the United States and in Canada the fire of the negligent camper, the indifferent locomotive fireman or the careless bush ranger is just as destructive to property as the fire of an enemy, whose aim it was to work ruin. In time of war the greatest vigilance is maintained. Public property is closely guarded; every bridge, railroad and canal is patrolled in fear that by some remote chance it might be attacked by the enemy. But in peace, we leave our great forest possessions in many cases without a corporal's guard and often without so much as a sentinel. And we are shocked and secretly rail against Providence rather than against ourselves when the inevitable happens.—*Pulp and Paper Magazine of Canada.*

LAURENTIDE CO. PLANTING.

The Laurentide Company, Limited, is enlarging its forest nurseries in order to provide for the systematic planting, on an increased scale, of considerable areas of nonagricultural, cutover lands in the watershed of the St. Maurice River. This work is being accomplished by the company's forestry division, which has just finished a survey and map of the company's limits, comprising 2,350 square miles of land, mostly timbered. The map shows all drainage, roads, portages and trails, lookout stations, telephone lines, and timber conditions. The company is also importing reindeer from Dr. Grenfell's herd in Newfoundland to take the place of sled dogs, which are very troublesome to keep in the summer and not very efficient in the winter. This experiment is being watched with much interest.—*Paper.*

Freighting Supplies to a Lumber Camp.

With the Forest Engineers.

DR. FERNOW'S SUMMER WORK.

Dr. Fernow spent his summer mostly at his summer home on the south shore of Lake Ontario, in New York, revising his *Economics of Forestry*. This volume, first printed in 1902, has become obsolete, especially in the statistics, and these have been brought up to date. Unfortunately, the firm of publishers who have handled this volume have suffered a financial setback, which will delay the printing of the new edition probably for a year.

Dr. Fernow attended the meeting of the Society for the Protection of New Hampshire Forests at Gorham, N.H., in August, and in connection with this the meeting of the Society of Northeastern Foresters at Berlin Mills. This meeting was of unusual interest, not only in that it brought some 25 professional foresters to a meeting in the woods, but these woods, belonging to the Berlin Mills Company, were the first on this continent in which a lumber and paper company had employed a forester with a view of improving their logging operations as regards securing clean work and reproduction. Mr. Austin Cary was the forester.

Unfortunately in a selection forest, the results can only be realized by him who saw the original condition, and hence the excursion without guidance of such a man remained more or less barren of results. But there were other features in the operations of the Berlin Mills Company that made the visit profitable. The company owns not only some 300,000 acres of forest in the States, but controls even larger areas in Quebec, and is an active member of the St. Maurice Fire Protective Association. Its paper mills are, perhaps, the largest on this continent, if not in the world, and are organized for efficiency, making by-products which one would hardly expect, such as chloroform and crisco, by using the excess of hydrogen resulting from the manufacture of the bleaching powder. The company employs four foresters in its wood department.

QUEBEC FOREST WORK.

Mr. G. C. Piché, Chief of the Forest Service, Quebec, writes:—

During the months of July, August and September the activity of the members of the Forest Service was devoted to the classification of vacant lots and the inspection of settlers' lots. We had 12 parties in the field, besides isolated rangers calling at the wood-working establishments to obtain their reports, or watching the movements of timber along the railways, [illegible] Montreal and Quebec. [illegible] Now that we have seen the limits of [illegible] the completed the published [illegible] the report of these explorations, we are beginning the organization for the control of the logging operations. Until recently there was a good deal of hesitation with our lumbermen, and the prospects of the cut were very bad, but the thermometer seems to be rising, as very few firms will not be at work this winter, and the timber crop will be about as good as last year, perhaps, suffering a diminu[illegible]

Considering the general situation, I believe this is remarkable, and it would surprise you, perhaps, to hear that some of the firms, especially the pulp mills, will increase their production.

Regarding the Forest School, I must inform you that we have entered the new building which has been built by Laval University for the faculties of Law, Surveying and Forestry. As we have better legs than the others, they gave us the two upper stories of the building (90 x 50) for our classes.

Our new quarters are very suitable, and we can hope now to build up some nice collections, etc., and we will rely upon our friends to send us as much as they can. Everything will be welcome.

The Forest Service has published a second bulletin, which deals with the general conditions of the forest lands in this province. Our first bulletin gave the names of the wood-working establishments. Until now we have only a French issue of this bulletin, but we expect to have the English version out in a short time.

TRIP TO THE YUKON.

Mr. W. J. Boyd, of the Forestry Branch of the Department of the Interior, accompanied by Mr. E. S. Davison, another graduate of the University of Toronto Forestry School, has returned from a five months' trip from Prince Albert, Saskatchewan, to Yukon Territory, and is now at the head office, Ottawa, preparing his report. The object of the trip was to secure data regarding forest conditions and forest protection along the lower part of the Mackenzie River, and especially in the Yukon.

The start was made from Prince Albert on May 15, when the two men, with their

baggage and a sixteen-foot Chestnut canoe, were taken by train on a logging railway running northwesterly from Prince Albert, a distance of about eighty miles, to Crooked Lake, the beginning of that wonderful series of watercourses, which, after three and a half months' hard travel, was to land them in Dawson, Y.T. Though this route, by way of a series of lakes, the Clearwater River, Athabasca River and Lake, and the Mackenzie River, to the Arctic circle, is not much heard of nowadays, it was, for a hundred years, one of the main highways of the Hudson's Bay Company. This part of the trip was accomplished without incident, the various points where there are Forestry Branch officers being visited and other duties performed.

This part of the journey was performed without guides, the two foresters paddling, portaging, camping and cooking along this two thousand mile journey without mishap. At Fort Macpherson, near the mouth of the Mackenzie River, Indian guides were engaged, as it was important to make good time, and the passage of the divide between the valley of the Mackenzie and the valley of the Yukon is somewhat intricate. The party then ascended the Rat River, which enters the Mackenzie near its mouth. This route is known as Macdougall Pass. After paddling through some small lakes on the divide, they reached a tributary of the Bell River, and then passed into the Bell itself. Traversing the Bell throughout, they entered the Porcupine and paddled down it to the Yukon River, which receives the Porcupine at Fort Yukon, in Alaska, U.S.A. They then ascended the Yukon River and reached Dawson on Aug. 24. From that time until they left to come out over the White Pass, on Oct. 9, they were engaged in exploring the different valleys and taking note of the state of the timber and the possibility of its protection from fire. Timber is vital to the carrying on of the industries of the Yukon, the different mining plants using thousands of cords for fuel every year. Fires have done great damage, and the need for protection was evident, but just what will be recommended will be made known in the report to the Branch. It is interesting to know that the trip was made without mishap, and that although the route from Prince Albert lay to the north and east of the Peace River country, into which settlers are now pouring, the travelers went over a comparatively well traveled path, and had no difficulty in securing supplies at the Hudson's Bay Company posts, sufficient to carry them over the next stage of the journey.

From the White Pass and Skagway they returned down the coast to Vancouver and returned east by railway.

Mr. E. S. Davison, who is a native of Bridgewater, Nova Scotia, has enlisted with the second Canadian contingent for the war in Europe, and is now at the training camp at Kingston, where he has the rank of sergeant.

BRITISH COLUMBIA FOREST PROTECTION.

In spite of hard conditions, the British Columbia fire protection system rendered a good account of itself this year. A report of the work says:—

'All records indicate that the weather has been drier during the present summer than at any other time during the past twenty years. Streams have run dry which have not been seen dry before. In addition, it has been very hot and windy in the southern portion of the province. Between 2,000 and 3,000 small fires have occurred, and it has been necessary to increase greatly the number of fire patrolmen and guards and to employ numerous fire-fighters. Fires have been fought regardless of their size or location, whether in settled country, range lands, scrub, reproduction or timber lands. The result has been that very few fires got beyond control, while those which had done so were brought under control before they had destroyed much merchantable timber. Thus the total fire loss for the province has been extremely small, although the cost of protection this year has been about $350,000. These results prove the value of elasticity of organization, since the forces could be increased quickly wherever weather conditions made such action necessary. Protection has not been restricted to merchantable timber alone, but has covered the whole country, and fires have not been able to gain a foothold anywhere.'

ANNUAL CONVENTION OF HOO-HOO.

The twenty-third annual convention of the lumbermen's fraternal organization, known as the Order of Hoo-Hoo, held in Winnipeg Sept. 8 to 11, was very successful in spite of the outbreak of war, which somewhat reduced the expected attendance. Delegates were present from all parts of Canada and the United States, the total attendance, including delegates and their wives, numbering 524. The business of the Order was despatched at the morning sessions, and the afternoons and evenings were devoted to social features. Most of the functions connected with the convention were held at the Fort Garry Hotel. An interesting feature of the meeting was the election of a Canadian, Mr. E. D. Tennant, of Winnipeg, to the highest office in the Order, Snark of the Universe. San Francisco was selected as the place of meeting in September, 1915.

THE DYING TREE.

Ah, it is saddening to see a beautiful and stately tree in process of decay; it took years to reach its height, and then there fell a deadly blight that ate its heart away. It seems to know it's in the soup, for all its leaves and branches droop, 'tis a despairing thing; and in the zephyr or the gale it seems to moan and sigh and wail, when it should dance and sing. There's nothing nobler than a tree, there's naught that more appeals to me, and oh, it makes me hot to think such stately things must die, because some derned old worm or fly has given it dry rot. And in our towns a million trees are dying of some punk disease imparted in that way; great elms that pleased our pas and mas are crumbling to the ground because such pests we do not slay. A little hustling out of doors might save the threatened sycamores, the locusts and the elms; so let us gird our loins today, and spray our friends the trees, and slay the worm that overwhelms. If you would sit supinely by and see a splendid shade tree die, and never lift a hand, if you would rise no doleful sound, when trees are dying all around, you surely should be canned.

WALT MASON.

Maine has installed twenty steel towers with [illegible] as part of the State forest protective system in the forest districts of the State.

A number of prominent citizens of [illegible] County have purchased a block of fifty acres of pine woods to prevent it being cut, as it is one of the few remaining pieces of forest in the county. Just how this can be made a public possession has not yet been decided.

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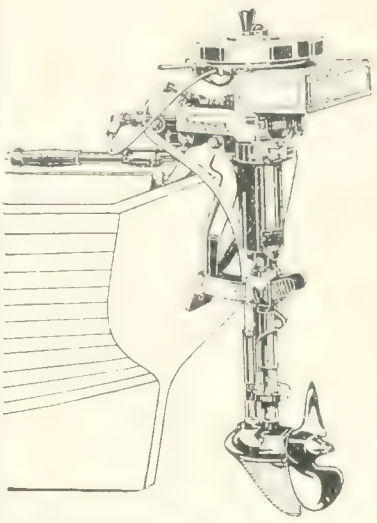
EVINRUDE



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FACULTY OF FORESTRY

JAN 13 1915

UNIVERSITY OF TORONTO

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ANNUAL BUSINESS MEETING

The sixteenth annual business meeting of the Canadian Forestry Association for the consideration of reports, passing of accounts, dealing with business arising out of the same, the election of officers, and such other business as may properly come before it, will be held in the assembly hall of the Carnegie Public Library, Ottawa, on Tuesday, January 19th, at 8 o'clock p.m.

All members in good standing are eligible to attend and vote. Members having business to bring before the meeting should communicate with the Secretary as early as possible.

Though the war takes up most of the national attention and energy, yet work so vital to the continued wellbeing of the nation as the protection of our natural resources

should be pressed forward as vigorously as circumstances permit, so that after the war our people will have the raw material out of which to build up renewed prosperity. All who can attend and take part are therefore requested to do so.

The Commission of Conservation holds its annual meeting on the mornings and afternoons of January 19th and 20th, in its offices opposite the Carnegie Library, so that those attending can participate in both meetings.

Owing to the fact that the Ottawa Winter Fair will be in progress January 19 to 22 fare-and-one-third railway rates will be in force for the round trip from all points in Ontario from Sault Ste. Marie—Toronto and east and from all points in Quebec. These are obtainable without certificates upon application to the railway ticket agent at point of departure.

Tickets are good going Jan. 18 to 21 inclusive, and returning are good up to and including Jan. 23.

THE PLACE OF THE FORESTS.

These are the days when the annual statements of the Presidents and General Managers of the Canadian banks are closely studied. It is instructive to note that in these reviews of Canada's financial situation the products of the forest are generally mentioned next after those of agriculture. In the views of these leaders farm products are Canada's first resource and forest products her second. Canada has too much fertile land for forest products ever to oust those of the farm from first place. But, on the other hand, there is so much absolute forest land in Canada that unless we are wantonly wasteful and negligent in the handling of our forests, forest products should never be displaced from their position in the second place of Canada's resources.

PUBLIC OPINION GROWING.

In the December issue of the *Canadian Forestry Journal* the fact was recounted that a man had been sent to jail in Quebec for setting fire to a forest. It was pointed out that as this was so very unusual in Canada some opposition might be made to his procedure, and friends of forest conservation were urged to support the organization which had the courage to take this step. We have just received from Mr. H. R. MacMillan, Chief of the British Columbia Forest Service, who noticed this paragraph, a note to say that this was not the only case where in Canada a man had been sent to jail for this offence. He writes: 'Up to the present we have had over forty prosecutions. Five men were put in jail for periods of from thirty to ninety days, and the remainder were fined from fifty to two hundred dollars, and in addition, in some cases, were required to pay the damages and costs of fighting fires due to their carelessness. He also notes that there have been more convictions in 1914 than ever before, and it, likewise, was the worst year from the standpoint of dangerous weather. We need only add that while we regret both the fires and the fines, not to speak again of the imprisonment, we can only be glad at this evidence of growing public opinion in favor of forest protection.

RAILWAYS AND FIRE PROTECTION.

The railways have always contended, and with reason, that much of the damage attributed to them came from tramps lghting fires as they walked along railway lines and from fires lighted by matches, and cigars thrown from moving trains. Those traveling recently in Canadian Pacific Railway trains have seen the following notice posted up in smoking cars. This is another way in which forest conservation is being brought home to the general public:

Forestry Conservation and Protection Against Fire.

'Travellers are respectfully requested not to throw lighted matches, cigarettes, cigars or contents of pipes from cars, as destructive forest and other fires have frequently been started in this manner.'

A United States agricultural journal draws attention to the thousands of acres of fertile soil which this spring (and every spring) was washed away from the hillsides and swept out into the ocean. The moral it drew from this was that hillsides should be retained in timber and other crops that prevent the washing of the soil.

Planting Spruce for Commercial Purposes.

Description of what the Laurentide Company is doing. Mr. Ellwood Wilson's results.

In a recent issue of the *Pulp and Paper Magazine of Canada*, Mr. B. K. Ayers, M.F., gave a description of the experiments which the Laurentide Company of Montreal and Grand Mère, Quebec, has been making under the direction of Mr. Ellwood Wilson, Superintendent of the Forestry Division of the Company. The following article is an abridgement and a continuation of Mr. Ayers' article, and the pictures have been

Scotch pine planted in 1908 near Grand Mere.

kindly loaned by the *Pulp and Paper Maga-*

The Forestry Division of the Laurentide Company has been in existence for about ten years now. For most of that period the survey work has taken up about all of its time and appropriation. This work, the mapping of water and timber on 2,350 square miles of limits, the running out, cutting and blazing of the limit lines; the estimate of the timber, and the other odd pieces of work such as survey of lots, trespass an.. cuttings, has been almost finished.

During this time the Forestry Division has done a lot of the more technical work, such as careful estimating, construction of volume tables for black and white spruce, balsam fir and white pine, growth studies of the same species and of jack pine and various

From the first the idea of Mr. Wilson, Superintendent of the Forestry Division, was that planting was the ultimate solution of the production of timber. Now it is not to be expected that a planting policy would be accepted by the Company without a great deal of discussion and opposition. Canada's supply of pulpwood is the greatest in the world. The St. Maurice Valley [illegible] square miles of the most accessible pulpwood in the Dominion, lying in a very favorable location with regard to waterpower sites, as well as easy shipment, and the Laurentide Company's 2,350 square miles is of the best of this. Most people would think that this amount of territory would keep the mill in logs forever, but cold, hard figures show that even this im-

Clear burn on Laurentide Company's limits on Upper St. Maurice.

mense holding is inadequate, and that it will all be cut out in a term of years variously estimated at from 50 to 75. This still distant end of the present supply, and the possibilities of planting as a provision for the future, have long been foreseen by Mr. Chahoon, Vice-President of the Company, and, in keeping with his far-sighted and broad-minded policy the Company has decided to undertake planting operations.

Mr. Wilson made the first plantations near Grand Mere in 1908. These consisted of about 20 acres of white, Scotch and jack pine. Since then planting has been done each year. Attention has been given to trees which are used for pulp. Four species have been specially tested; black and white spruce, balsam fir and Norway spruce. As a result of this, in the opinion of Mr. Wilson, the Norway spruce is the most sat-

Land formerly having pure stand of pine, cleared for farm 10 years ago, but soil too poor and so abandoned.

Underplanting young poplar and white birch with Norway spruce.

isfactory tree. The black spruce grows very [illegible] and the seeds of white spruce and balsam fir show a very low percentage of germination and are hard to get started in the nursery. The Norway spruce does well in the nursery and grows rapidly when set out.

By trial Mr. Wilson has also proved that trees grown on the ground do better than those bought outside. For this reason a [illegible] This has been enlarged until now there are [illegible] good water supply system. The results of [illegible] ed that only home-grown stock could be depended upon, that spruce could not be successfully planted in open sandy areas unless the season was favorable, and that fall planting was preferable to spring planting.

Planting crew putting in trees on side hill.

In the spring of 1914, 75,000 trees were planted on property of the Laurentide Company on the west bank of the St. Maurice River. This sandy land unlaid with clay was originally covered with a stand of pine. This was cut off and the area burned over twelve years ago. The tract has grown up to an open stand of white birch and poplar, and it was in this partial shade that the spruce was planted, the belief being that it would do better than when planted on similar soil in the open. Once established the spruce will overtop the birch and poplar, and the latter can then be cut out if necessary when large enough for pulpwood.

The planting in the spring of 1914 was done by Italians, one half of the gang going ahead with mattocks and making holes, while the others followed with the seedling trees kept wet in a pail of mud and water. Trees were planted 5 feet apart each way. The cost was $14.95 per acre, made up as follows: cost of trees, $4.16; express, 53c; labor, $8.11; supervision, 96c., and miscellaneous, $1.16. The latter included cartage and inspection of trees bought.

The planting was continued in the fall of 1914 with the labor of Canadian woodsmen. These men required less supervision and were more efficient, with the result that the cost was reduced to $7.92 per acre.

Now that the fire protection question is practically settled by the success of the St. Maurice Forest Protective Association, planting has become a commercial proposition, and Mr. Wilson expects that when the nursery is fully working they will be planting 500 acres per year, and that the much greater quantity of wood per acre as compared with virgin growth and its consequent greater accessibility and ease in harvesting will be elements in making it profitable.

The Nursery Laurentide Co., Grandmere, P.Q. In the bush seen at the back of the picture the reindeer are located for the winter.

CARELESSNESS CAUSES FOREST FIRES.

An investigation by the New York Conservation Commission as to the origin of forest fires in the Adirondacks shows that fully 85 per cent. of the fires which occurred during 1913 were preventable. If smokers had not carelessly thrown burning cigars or tobacco upon the dry vegetation, one-third of these fires would not have occurred. If fishermen had been more careful with their fires and tobacco nearly one-fifth of these fires would not have occurred. Of the 688 fires reported, only 78, or 11.3 per cent., were caused by locomotives, while nearly 10 per cent. were reported as being due to the carelessness of campers.—*Conservation.*

Indiana has two Arbor Days, one in April and another in October. The State Board of Forestry is carrying on an active campaign.

A REINDEER EXPERIMENT IN QUEBEC.

Last August Mr. Edmond Wilson, Superintendent of the Forestry Division of the Laurentide Company, Grand Mere, Quebec, purchased twelve reindeer from Dr. Grenfell, the main herd at that time being at St. Anthony, Newfoundland. Mr. Wilson got the deer safely into the St. Maurice Valley after considerable delay, caused by the war, but one of the deer was so badly injured on shipboard that it died some time after. Four deer were sent to a timber depot and three of them died, possibly from lack of experience on the part of those in whose charge they were. Mr. Wilson, therefore, had the remaining eight deer, three bucks and five does, brought into the town of Grand Mere, and located in a wooded lot adjoining the nursery. Mr. Wilson's idea is that the deer have been allowed to become too wild since being brought from Lapland, and his aim is to domesticate them and keep them accustomed to the presence of man. When this has been attained he sees great possibilities for their use in northern lumber camps to take the place of dogs, which are vicious and very subject to mange, and he also thinks that the Indians might learn to herd them, thus becoming possessed of a supply of food and clothing, besides having a beast of burden which will find its own food summer and winter.

A PLEASANT REMINDER.

The *Canadian Forestry Journal* has received from the Dominion Forestry Branch staff of the Duck Mountain Forest Reserve, with headquarters at Dauphin, Manitoba, a unique remembrancer in the shape of a calendar illustrating the work. The illustrations are five photographs of scenes on the Reserve including 'Fire Guard and Telephone Line', 'Graded Trail Through the Forest', 'Grandview Ranger Station', 'Corduroy Road on Baldy Mountain', and 'Lookout Tower'. In the corner is the motto 'Safety First' supported on left and right by field telephones. The staff consists of Mr. C. W. Wellman, Forest Supervisor; Mr. W. R. Watt, Forest Assistant, and Miss M. A. Weatherhead, Forest Clerk. The illustrations show that the work of protecting the Reserve by modern appliances and methods is rapidly advancing.

A careful survey of the state of New York has shown that one half of it is better adapted to forestry than to agriculture.

Hon. G. Howard Ferguson, New Minister of Lands, Forests and Mines for Ontario.

When Hon. W. H. Hearst was called to be Prime Minister of the Province of Ontario it was understood that it would be impossible for him to combine the duties of that office with the particularly onerous and exacting work of the Department of Lands, Forests and Mines. This is one of the very heaviest departments in the Government and has, what is unusual, two deputy ministers, Mr. Aubrey White, C.M.G., for Lands, Forests and Mr. J. W. Gibson for Mines.

As a result of Hon. Mr. Hearst's elevation to the Premiership there have been several changes in the Cabinet, and Hon. G. Howard Ferguson, member for Grenville, has been appointed Minister of Lands, Forests and Mines and has already taken up the important duties of his office.

According to the handbook issued by the Provincial Government, there are now 272 sawmills in British Columbia, employing about 5,000 men, the output of lumber in 1912 being 1,330,000,000 feet. There are sixty shingle mills, with a daily capacity of 5,000,000 shingles. The capital invested in the timber business is over $200,000,000.

The removal of forests is largely the cause of floods and freshets and soil erosion; the latter produces one of the great wastes of agriculture.

Destruction by Fire and Wind.

Results of Bad Fires in the Lake of the Woods Country.

Mr. M. J. Stevenson, of Morris, Manitoba, writes:

'I have lately returned from an exploring trip in the forests of western New Ontario, northern Minnesota and southeastern Manitoba, and I must say the destruction on all sides by forest fires is appalling. Mile after mile was traversed of what had once been virgin forests, but through the agency of this scourge of the woods they have been converted into a desolation of charred and wind-thrown trees.

'It was the same story in each of the provinces, thousands of acres of the finest timber turned out by the roots by the wind and lying rotting on the ground. This timber, every stick of it, is badly needed in our prairie provinces adjacent thereto. It took hundreds of years to grow and is swept out of existence in a few moments of time. As a great deal of this land on which the timber has been burned is totally unfit for agriculture, and as the fires have been so severe that there are practically no seed trees left over vast areas, the national loss is the more apparent.

'I have in mind a splendid forest of jack pine in eastern Manitoba that was killed by fire in 1888. These trees were a pure mature stand, growing on non-agricultural land and were from eight to twenty inches in diameter, and from eighty to one hundred feet high. This forest has been burned twice since. The last fire caught the young trees before they were old enough to bear seed, and to-day the site of this once splendid forest is a sand desert.

Now this is occurring on millions of acres in Canada to-day; land that is too stony or sandy to ever be of any use for agriculture. It seems to me this is a very short-sighted policy on our part (or no policy at all) to allow this thing to continue. God in his goodness is sending the sunshine and the shower year after year on these lands, and everything needful for forest growth; and we by our negligence are allowing it to go to waste. We have vast areas in Canada on which at the present time all that is needed is to keep out the fires to ensure a good forest growth. Every year's delay on our part will make a greater area to be reforested in the future at great expense, besides losing valuable time.

'There never was a time in the history of the world when so much timber in one form or another was being used. We are using our own share as well as the share of future unborn generations. In consequence a mighty timber famine is upon us. It is bad enough now, but what will it be in a few years, when we have cut all the old stand, the growth of centuries?

'To my mind, this forestry question is one of the greatest problems before the people of Canada to-day. Something must be done, and done quickly, if we are to make our forests a blessing to future generations, as they have been to us. A few more years of such wicked wanton waste and our forests, God's richest legacy to the Canadian people, will be beyond recall.

'I congratulated the Canadian Forestry Association on the good work it has already accomplished along forestry lines. Keep pounding away. Get the people interested. When they get their eyes opened to the true state of affairs they will act, for it is very seldom we find a government in advance of the people.'

STUPIDITY STREET.

The following lines against wanton and foolish destruction of bird life are by Ralph Hodgson, one of the younger English poets:

I saw with open eyes
Singing birds sweet
Sold in the shops
For the people to eat,
Sold in the shops of
Stupidity Street.

I saw in vision
The worm in the wheat,
And in the shops nothing
For people to eat;
Nothing for sale in
Stupidity Street.

The forests of Corsica, the little island upon which Napoleon was born, are managed by the French government. They produce lumber, firewood and turpentine, and all parts of the tree are far more closely utilized than in America.

An Ontario Farmer's Plantation.

What One Ontario Farmer Has Done to Beautify and Improve His Farm.

One of the editors of the Farm and Country Life section of the Toronto Globe describes a visit he paid recently to the farm of Mr. Norman Silverthorn, near Summerville., Peel County, Ontario. The pines and cedars that mentioned farm is boundary to his large farm on the [illegible] ing the main highway between Toronto and Hamilton. The writer, whose pen name is Timothy Spray, says:

Motorists and others, who coming from Hamilton by way of Summerville and Islington, have occasion to pass the farm on which Mr. Silverthorne lives, seldom fail to notice the evergreen facade which extends far to the right of the main road. The farm is situated on the level top of the high ground skirting a tributary of the Etobicoke River, and as far as the eye can see the surface of the ridge is hidden by a wonderful growth of pine and cedar. A casual glance is enough to convince the passer-by that the forest is not the work of nature. Only those, however, who take the trouble to go in and talk with the planter will hear the history of the planting.

'My father built a mill near this very spot in 1809,' Mr. Silverthorn told me, as we made our way along the cedar-skirted face of the crest. 'There was lots of bush in those days, and the Indians roamed and camped all over the neighborhood. After the clearing was done and the orchard had come into bearing it occurred to me that a splendid windbreak could be formed by planting small evergreens all along the face of the ridge. I knew where I could get any quantity of the small seedling trees, so I went to work.'

[illegible]

'How many did you set out?'

'About ten thousand trees in all.' (Think of that self-imposed task for a man then over sixty years of age.) 'On the very edge of the cliff I planted poplars, and behind them the pines and cedars. The poplars grew very rapidly. See'—he led the way to a rotting stump of perhaps eighteen inches diameter—'here is the stump of one of the poplars; there is another. Now you can see the line of stumps.'

'You removed all the poplars, then?' I asked.

'Yes, when they were twenty years old. I cut them down to give the other trees a [illegible] 'air row.'

[illegible]

The poplars, therefore, not only served their turn in the growth of the protective forest, but they also netted Mr. Silverthorn more than ample return for the work of planting them. To-day the visitor sees the evergreen growth at its best. All over the face of the hill and running for a considerable distance along the river bank is a dense forest of pine, cedar and old birches, Junewoods, etc. The commercial possibilities of such a proposition as evergreen reforestation are indicated by the pines, which here and there tower above the growth of cedars. Many of these trees are between thirty and forty feet in height, with a [illegible] eighteen inches. That they should attain such a size in twenty years' time would be hard to believe were one not aware of their origin and life history.

[illegible]

Mr. Silverthorn's tree-planting was not confined to that portion of his farm which, fronting on a much-travelled highway, is in full view of passing admirers. As we walked toward the back of the farm and down a well-shaded lane, he pointed to the rows of stately trees rising high overhead, with the terse comment: 'Butternut Row. All these trees were planted at the same time, and all are butternut.' From the very manner of his speech I knew that he looked forward to no word of praise or flattery; he was simply recalling an act of his life which he considered as in no way out of the ordinary. Then came a tramp through the multi tinted maple grove, and here again the love of my guide for the forest manifested itself as he spoke of sylvan wonders, such as an old tree 'four hundred and fourteen years old, by actual count.'

Mr. Silverthorn, the owner of one thousand acres of farm land in the county, is now retired, and no more dependent upon his daily toil. He still takes the keenest interest, however, in the affairs of farm life, and with the boyish wholeheartedness of the real enthusiast delights to show to the [illegible] of co-operative forestry.

Planning for Street Trees.

Suggestions for improving conditions in Canadian Towns and Cities.

Mr. G. A. Cromie, who some years ago was forest assistant in the Dominion Forestry Branch work in British Columbia, and who is now Superintendent of Trees, in the Department of Public Parks, New Haven, Connecticut, writes giving some hints on how to go about improving shade tree conditions in our towns and cities. While this is not forest conservation in its strict sense, yet good shade trees are so valuable an aid in forming public opinion on this matter that we have pleasure in publishing Mr. Cromie's article. He says:

On looking over the century-old elms and maples in New Haven, Connecticut, of which I have charge, I can see how much can be gained in such fast growing cities as Vancouver, Saskatoon, Winnipeg, and in the newer sections of Eastern cities, if they will follow a systematic plan in street tree planting; and even towns or villages will secure better shade trees where one person or department is responsible for their care instead of leaving them to the general public. Many members of the Canadian Forestry Association have the necessary training, and can give some time, at actual work of this character in the smaller places, or in larger cities, to organize a movement to place the street trees under a competent civic department.

The eastern United States are fast falling into line in this work, cities of 100,000 population or larger hiring an expert forester and staff and spending from $3,000 to $30,000 a year, smaller ones placing street trees under the park commissioners, and towns often getting expert advice for a starting plan and doing the work under a local tree warden working part of the year, or a commercial nursery. Many of these were forced to take such steps by the large number of old trees that were dying and the poor results from private planting under modern street conditions. Those get the best results in which all the work—planting, treatment for insects, tree surgery, maintenance, removal—is done by a city department; the system of private work under permit or supervision has not been a success.

Here are some ways in which foresters and other members of our Association can help to start such a movement in their home town:

Plane Trees (European Sycamore) Planted one year. Set 35 feet apart.

1. Choose a number of new streets and induce the authorities—or by public subscription raise the needed money—to plant them uniformly with proper species. Ask the best local paper to help you; they are always glad to back any such movement that takes with the people. The interest aroused should help in extending the work.

2. Gather the data needed for a good planting plan; count the present trees on each street, by species, using the card system, with a note on their height or age class and condition; note the number of new trees needed on each street, locating them by house number if necessary, and suggest the knds to be used. In this way you can

ted the number and species of trees in the city, and you have the information for any future planting or even for starting a municipal nursery. Boy Scouts or high school boys can be interested in the outside work; they save a lot of steps in pacing, and you will be surprised to see how quickly a hundred miles of streets will be listed.

3. Get a woman's club to solicit each house on one or two of the newer and better streets for the wholesale cost of planting, you to take charge of the planting. Any nursery will quote you better prices than if they had to deal with each property owner.

In any case planting is the keynote of your work. It means most in after results; it is inexpensive as compared with removing old trees; it attracts public interest.

Climate varies so in different sections of Canada that local trees should be examined, and advice secured from the nearest agricultural experimental station in selecting kinds to plant. Evergreens are not desirable for street use. Our New Haven list—American and English elms, sugar, red and Norway maples, plane (European sycamore), basswood, the European lindens, and red and pin oaks—seems to do well at Niagara Falls, and should apply to Southern Ontario and Western Coast cities. Further inland, or north, the list must be cut down to the maples and elms and such trees as thrive locally. The list given out from Indian Head for farm planting, and headed by box elder (Manitoba maple) and balsam poplar, should do well in prairie cities, but remember that street trees have not the protection of those in a grove, and some provsion must be made for watering and mulching. I favor strongly the top mulch of strawy material in all planting, and wonder at not seeing it used instead of the dust mulch in prairie tree planting, where straw is so plentiful, and time is so scarce in the cultivating season.

Some of the mistakes liable to be made are too close spacing, trying to plant too large trees, and using fast growing species at the expense of quality. As to spacing forty feet apart will allow alternate light and shade on the street, and it is not practicable to plant closer with the idea of taking out half the trees later on. In regard to size, trees two inches in diameter and 12 feet high, if given good soil, six foot wire guards and watered frequently during the first two years, will be the most satisfactory in the end.

Contrary to popular belief, forest fires seldom travel more than two or three miles an hour. Even in extreme cases it is questionable whether they burn at a rate of more than six to ten miles an hour.

Mr. George Bury, Newly-Appointed Vice-President of the Canadian Pacific Railway.

With the beginning of 1915 Mr. George Bury, formerly Vice-President and General Manager of Western Lines of the Canadian Pacific Railway, with headquarters at Winnipeg, became Vice-President of the system with headquarters at Montreal. Mr. Bury as one of the executive heads of the C.P.R., has naturally had much to do with forest fire protection along the line. At the Winnipeg Convention of the Canadian Forestry Association, Mr. Bury read a paper on 'The Railway and Forest Protection'. Mr. Bury succeeds Mr. David McNicoll, who retires because of ill-health.

THE DESTRUCTIVE MATCH

A valued forest, long and wide,
Adorned the sloping mountain's side;
A smoker's burning match was thrown,
And by the breezes fanned and blown,
Till all that splendid forest green
A worthless waste may now be seen.

The Diana Paper Company, of Watertown, New York, has planted 150,000 spruce seedlings on its property in the Adirondacks. The company has established its own nurseries and will continue planting at an accellerated rate from now forward.

MINNESOTA'S CONSTITUTIONAL AMENDMENT.

On Nov. 3 at the Minnesota elections a number of important amendments to the State constitution were submitted to the voters. These amendments numbered eleven, and of them all only one was carried, No. 9. This amendment was one which changes the method of management of State lands. Up to this time all State lands were handled on the assumption, so common in all parts of this continent, that all lands would eventually be used for agriculture. In the constitution it was provided that the lands still in the possession of the State were to be sold and the proceeds devoted to schools and other worthy objects. In past years the great bulk of the agricultural lands owned by the State have been sold and settled upon and the lands that remain are largely forest lands. Yet the constitution made no provision for this, and if something had not been done these lands would have been auctioned off, would have been stripped of such timber as they carry to-day, attempts would have been made at settlement; and by fire and axe and plow a large part of the State would have been reduced to desert. By the amendment carried on Nov. 3 such school and other public lands of the State as are better adapted for the production of timber than for agriculture may be set apart as State forests, and the legislature may provide for the management of the same on forestry principles. The net revenue is to be used for the purpose for which the lands were granted to the State.

This was a very great victory, and its significance is heightened by the fact that every other proposed amendment was defeated. This amendment stood ninth on the ballot, and never in the history of the State had an amendment passed which stood lower on the list than fifth. In order to carry the amendment it was necessary to secure a majority of the total vote cast on all subjects at the polls on election day. The total vote cast was 356,906. Those votes which were not cast on the amendment at all counted against it. The total number of votes cast for the amendment was 178,954, while against it were cast 44,033. The amendment thus had a majority of 501 votes.

Great praise is due the Minnesota Forestry Association which since June last has been campaigning to this end. In the fight they enlisted the aid of the newspapers, the women's clubs, the churches, bankers, commercial clubs, telephone companies, farmers' clubs, manufacturers, school teachers, forest rangers, game wardens and county agricultural representatives. The campaign was carried on by means of public meetings, motion picture shows, lantern lectures, exhibits at fairs, demonstrations on State Forests Day, and by the distribution of 300,000 booklets and 47,000 posters. One of the effective means was the calling up by telephone, by the members of women's clubs, of voters on Nov. 2 and the reminding of the voter not to forget Amendment No. 9.

There are still left in the possession of the State of Minnesota about two and a half million acres of land, much of which is forested, and which will now be available for management on forestry principles. Minnesota is to be congratulated all around.

REPORT ON IRRIGATION.

Up till the end of 1912 irrigation work in western Canada was carried on under the supervision of the Dominion Forestry Branch. At that time, however, owing to the great increase in the work, irrigation was made the work of a separate Branch, with Mr. E. F. Drake as Superintendent. The report for the year 1913, the first as a separate Branch, has now been issued. It is a volume of 180 pages with maps and plates, and an inspection of it shows how important this subject has grown. This irrigation work is closely connected with forest conservation, because practically all the rivers dealt with rise in the foothills of the Rocky Mountains and are fed by the forested lands of the eastern slope of that range.

The report notes the increasing demand for water because of the rapid settlement of the prairies and because of the completion of some parts of the Canadian Pacific Railway irrigation project which will eventually irrigate three million acres. The work, outside of the administration work at Calgary and Ottawa, is divided into stream measurements, special hydrographic surveys, and drainage investigations. With these goes the inspection periodically of both building and completed irrigation projects. Among the works under supervision are the 1,600 miles of canals and ditches on the western section of the Canadian Pacific work. This will be greatly increased when the central and eastern sections of the same project are completed.

Southern Saskatchewan in the Moose Jaw-Regina district has a large and growing population, and its water supplies from streams and rivers are comparatively small. The Provincial Government has made an application for a reservation of one hundred million gallons of water per day from the South Saskatchewan River to be diverted for this purpose. Reconnaissance surveys have shown the feasibility of this diversion, but that its cost will be great. Further surveys are now going on.

In Southern Alberta there is another set of problems of an international character. Here there are already irrigation projects in being but two of the chief existing rivers flow back and forth across the International boundary. By agreement with the United States, Canada and that country are to take equal amounts of water from these rivers, and measurements are in progress to determine what the regular flow is. Measurements are also in progress to ascertain what amount of water can be taken from the Bow and North Saskatchewan rivers for irrigation. This will serve to show the extent of the work. Persons desiring copies of this report may obtain them upon applying to the Superintendent of Irrigation, Ottawa.

GREAT SAND HILLS FOREST RESERVE.

Mr. Charles J. Herriot, of Sandford Dene, Saskatchewan, writes:

'In reply to yours of Nov. 17, I would say I am pleased to note that the necessary steps towards the formation of a forest reserve in the Great Sand Hills have been taken.

'Throughout this district the people are well pleased with the prospects, and welcome the idea, as it will mean added protection against fires, which have been very common during the past four years.

'These Sand Hills are truly a fire trap, there being such an amount of dead scrub and long grass, where it is not burned to the bare sand. The area of bare sand is increasing yearly, while in some portions there is springing up a good growth of poplar.

'As I have just served a term on the Local Council, (Rural Municipality of Pittville, No. 169 Sask.) I might say that when I brought the matter before the Council, early in June, 1914, they tabled the question till they had each felt the pulse of the people in their respective wards. At the next meeting, the Secretary was instructed to write the Department of the Interior, Ottawa, asking that the area above mentioned be withdrawn from settlement, pointing out that it was absolutely worthless for farming. The Board was unanimous that this would be in the best interests of the community at large.'

SMOKING IN THE WOODS.

Considerable discussion has taken place on the Pacific Coast as to whether it is possible to stop smoking in the woods. Mr. Arthur J. Hendry, of the B. C. Mills Timber & Trading Co., writes thus to the *Timberman*:—

I agree with you that smoking in the woods during the dry season is a [illegible] and I personally believe that if we could do a good thing to smoking could be prohibited in the woods during this season of the year, yet I do not see how this could be properly enforced [illegible] logging camps are more or less scattered through various parts of the workings, it is impossible at all times for the foreman to see some of the men, and no doubt unless some one was around where they are working, probably some of them would smoke notwithstanding any regulations which might be on the statute book. I might say that there is already in the statutes of British Columbia, 1912, a clause which seeks to restrict this, and is as follows:—

''During the close season every person who throws or drops any burning match, ashes of a pipe, lighted cigarette or cigar, or any other burning substance, or who blasts wood with any explosive in any forest or brush land, or at a distance of less than half a mile therefrom, shall completely extinguish the fire of such match, ashes of a pipe, or other burning substance before leaving the spot.''

'I am not prepared to say whether anything more can be done in this direction at the present time.'

THE VALUE OF YOUNG TIMBER.

The British Columbia Forest Branch, in a recent bulletin, says:—

'It has been found by experience that a large proportion of the fires which start in slash or young timber will, if allowed to run, spread to valuable timber or property, and when beyond control destroy the homes of settlers in the small villages now being built up throughout the province, and cause loss of life. The protection of the settlers, as well as of the timber, is not assured unless all bush fires are kept under control during the dry season.

'Young timber growing on non-agricultural land is an asset well worth protection from fire. Nearly every settler knows how rapidly young timber grows to pole and tie size. In most districts in British Columbia timber reaches commercial size in sixty or eighty years. It requires no planting, grows without care or expense, and produces a valuable crop, which now beautifies the hills, protects the watersheds, and will, in another generation, support industries. These facts are so well understood in British Columbia that the Forest Branch is everywhere securing the co-operation of the residents in preventing destructive fires in the young as well as the old timber.'

OBITUARY.

It has not been the custom of the *Canadian Forestry Journal* to maintain an obituary column, but during the past three months so many men prominent in lumbering and forestry have passed away that special mention has had to be made of the fact. The hope is expressed that it will be many months before a like necessity shall arise again.

SENATOR ROBERT JAFFRAY.

Hon. Robert Jaffray died at his home in Toronto on Dec. 16 from the bursting of a blood vessel. Mr. Jaffray was born in Scotland in 1832, but had lived from his twentieth year in Toronto, where he was identified with many commercial and financial undertakings. Just a few weeks ago, upon the sudden death of Mr. D. R. Wilkie, on Nov. 16, he was elected President of the Imperial Bank of Canada, which institution thus lost two Presidents in succession in one month. Senator Jaffray, both in his personal and business capacity, as well as in public life, was a supporter of forest conservation. The family residence, surrounded by fine old trees, is just across the street from the residence and grounds of the late Alexander Manning, which now forms the home of the Faculty of Forestry of the University of Toronto.

SENATOR J. N. KIRCHHOFFER.

Hon. J. N. Kirchhoffer died at his apartments in Ottawa on Dec. 22 after a long illness. He was born in Ireland in 1847, but had spent all his working life in Canada. In the west he was known as the founder of Souris, Manitoba, and later for a number of years practiced law in Brandon. He was a great lover of outdoor life, a sportsman and a friend of the forests.

MR. V. R. MARSHALL.

Mr. V. R. Marshall, of Brockville, Ont., died after a somewhat lengthened illness on Oct. 2. He was born at Toledo, Ont., in 1849, and in 1874 started in the lumber business in Brockville. This later developed into the Brockville Lumber Company, of which he was the President and Manager until a year ago, when he sold out his interests and retired. Mr. Marshall was a man of very observing habits, and his interest in forest conservation was quickened by passing over an old farm at a lumber depot which he remembered as a young man being an oat field, and which, at the time of his visit, had a fine growth of pine which he estimated would in twenty years be ready for the axe. He argued that if Nature could do this unassisted she could do much more by the application of intelligent methods. Perhaps the last time Mr. Marshall came to Ottawa was on the occasion of the Canadian Lumbermen's Association meeting and Canadian Forestry Association annual meeting in 1914 when he spoke with very warm interest of the work.

MR. THOMAS CHARLTON.

Mr. Thomas Charlton, a well known lumberman of North Tonawanda, N.Y., died at his home after a long illness on Nov. 29, at the age of 75. Mr. Charlton was a member of the well known family which made Lyndoch, Ont., their home and center of operations for many years. With his brother, the late Hon. John Charlton, he began in the lumber business in 1869, purchasing 300,000 acres of timber land on Georgian Bay, Ont. He continued in this business all his life, and was one of the prominent citizens of northern New York, and active in the affairs of the Presbyterian Church, of which he was an elder. He leaves a wife and six children, and is also survived by two brothers, Mr. George Charlton, of Los Angeles, California, and Hon. W. A. Charlton, of Toronto, immediate Past President of the Canadian Forestry Association.

MR. A. H. HILYARD.

Mr. A. H. Hilyard, Manager of the Dalhousie Lumber Company, Dalhousie, N.B., died very suddenly of pneumonia on Dec. 3, at the age of 57. Mr. Hilyard had been lumbering all his life, and at the time of his death in addition to being Manager and Vice-President of the Dalhousie Lumber Company was a Director of the St. Maurice Lumber Company. Mr. Hilyard took a warm interest in the forestry convention in Fredericton, New Brunswick, in 1910, and since that had been identified with the work.

A petition signed by several thousand taxpayers in Calhoun County, Michigan, was presented to the Board of Supervisors at their October session, asking that $1,000 be appropriated each year for the planting and care of fruit trees along the highways where State Reward Roads have been built. This petition was endorsed by the Central Fruit Growers' Association, the Horticultural Society and the Battle Creek Chamber of Commerce. The object is to beautify the roadways and to produce a revenue from the sale of fruit to go toward the upkeep of the roads.

FORESTRY PROGRESS DEPENDS ON PUBLIC.

'Progress in forestry depends more upon what the public permits than upon what foresters and lumbermen perform.' This is a conclusion of the Forestry Committee, as expressed at the Washington Conservation Congress.

'As a consequence,' the committee goes on to say, 'public education is of prime importance, and the best methods of educating the public demand special study. Since no one else has the interest or the requisite forestry knowledge, foresters and lumbermen must learn this trade or profession in addition to their own. It is not forests, but the use of forests, which we seek to perpetuate, and therefore, to be sound and convincing, education must include a knowledge of the lumber business.'

In presenting some of the educational devices the committee commended particularly the booklets prepared by various forest fire protective associations. One device is a paper drinking cup to be folded by children, each fold telling a pictured story of the growth of a forest fire, and of the evils of its effects. Still another is a match box legend which points out that, while a match has a head it cannot think for itself, but is dependent on the thought of the user to keep it from being harm to the woods.

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The Membership Fee is one dollar per year. Members receive free of any additional charge the Annual Report and *Canadian Forestry Journal.*

Application for membership may be made as below:—

Canadian Forestry Association,
Journal Building, Ottawa, Canada.

Gentlemen:—I desire to become a member of the Canadian Forestry Association and herewith enclose One Dollar membership fee.

Name

Address

Date

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THE ANNUAL MEETING.

The Sixteenth Annual Meeting of the Canadian Forestry Association was held in the lecture hall of the Carnegie Library, Ottawa, on Jan. 19, 1915, at 8 p.m.

There was a good number present as will be seen from a list of some of those present in a later part of this issue.

In the absence of Mr. William Power, M.P., President, and Mr. F. C. Whitman, Vice-President, Hon. H. Bostock was elected Chairman.

On motion of Messrs. Power and Wilson the minutes of the last previous annual meeting were taken as read.

The Chairman nominated the following as the Nominating Committee and they were elected by the meeting: Messrs. R. H. Campbell, W. C. J. Hall, Hon. Sydney Fisher, Ellwood Wilson, A. S. Goodeve, C. Jackson Booth and J. B. White.

Letters of regret at inability to be present were read from Mr. William Power, M.P., President; Mr. F. C. Whitman, Vice-President, and Messrs. William Little, Aubrey White, E. Stewart, George Y. Chown, John Hendry, Hon. W. A. Charlton, Denis Murphy, C. E. E. Ussher, Alex. MacLaurin, William Pearce, and R. D. Prettie, all Directors.

Letters were read from Messrs. Ellwood Wilson, W. C. J. Hall, W. Gerard Power and Paul G. Owen, Secretary of the Quebec Limit Holders' Association, urging that ef-

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MAR 1 1915

forts be made to induce the Dominion Government to place the Intercolonial Railway and the National Transcontinental Railway, so far as operated by the Dominion Government, under the same regulations as to fire protection as the privately-owned railways of the Dominion are placed by the Dominion Board of Railway Commissioners.

A letter was also read from Mr. Sidney Downer of the Macleod Pulp Co., Liverpool, Nova Scotia, protesting against the custom of allowing from thirty thousand to fifty thousand young spruce trees to be cut along the south shore of Nova Scotia every winter for export to Boston as Christmas trees.

The Chairman presented the Directors' Report as it appears on another page, and the same was adopted on motion of Col. Harkom, seconded by Mr. Wilson.

Treasurer's Report.

The Secretary presented the Report of the Treasurer for the year 1914 as certified by the Auditors, as follows:—

Receipts.

Balance from 1913	$ 925 19
Membership fees	2,086 21
Sale of reports, etc.	13 25
Advertising in *Forestry Journal*	125 41
Sale of lantern	35 00
Grant from Dominion Govt.	2,000 00
Grant from Ontario Govt.	300 00
Grant from Nova Scotia Govt. (for convention)	400 00
Grant from British Columbia Govt.	200 00
Interest	54 70
	$6,139 76

Expenditure.

Salaries	$2,579 71
Forestry Journal	787 59
Printing and Supplies	253 58
Annual Reports	505 37
Secretary's expenses	100 00
Telegraph and telephone	8 54
Halifax Convention	524 63
Lantern lectures	128 95
Commission on cheques	10 84
Postage	105 00
Miscellaneous	18 61
Refund to Nova Scotia Government of grant for Convention	400 00
Furniture (including addressing machine)	110 75
Balance	606 19
	$6,139 76

On motion of Mr. Hall, seconded by Mr. Wilson, the Treasurer's Report as certified by the Auditors was received and adopted.

Special Committees.

Mr. A. S. Goodeve, convener of the Special Committee on a Forestry Congress, reported that on July 22 Sir Robert Borden, Prime Minister, had intimated that he was ready to take up the question of a Dominion Forestry Congress. He (Mr. Goodeve) had immediately replied through the Secretary of the Forestry Association that the Committee was ready to assist in any way possible and asking for information on certain points which was necessary before the Committee could act. In a few days subsequent to this war broke out and nothing further had been done.

Mr. Ellwood Wilson, convener of the Special Committee on the formation of Local Associations reported that he had done a good deal of work in the year in endeavouring to arouse interest in the formation of local associations, but the parties approached had not responded.

It was moved by Mr. Wilson, seconded by Mr. Power, and Resolved: That the Association strongly urge the Government to subject the National Transcontinental and Intercolonial Railways to the same rules and regulations, as to fire patrols and fire protection, as are now imposed on all other railways by the Board of Railway Commissioners for Canada.

Moved by Col. Harkom, seconded by Chancellor C. C. Jones, and Resolved: That a committee of five (to be nominated by the Chairman) be appointed to subimit to the Government a copy of the above Resolution, the Committee to hold office until the next annual meeting.

Subsequently this committee was selected as follows: Hon. H. Bostock (convener) and Messrs. Denis Murphy, C. Jackson Booth, Ellwood Wilson and Chancellor Jones.

It was moved by Mr. A. S. Goodeve, seconded by Lt.-Col. J. B. Millar, and Resolved: That the thanks of this Association be accorded His Royal Highness the Governor-General for his kindness in acting as Patron of the Association; the Governments, and Chartered Banks which have assisted the Association by way of grants, to the Railways for facilitating the work in various ways, and the Press of Canada for their sympathetic help in the way of publicity.

Moved by Hon. Sydney Fisher, seconded by Mr. A. C. Campbell, and Resolved, That the members of the Canadian Forestry Association learn with regret that impaired health is the cause of the absence from this meeting of Mr. William Little of

Montreal, one of the pioneers in forest conservation in Canada and one of the early Presidents of this Association, whose membership at the time in the days of its unpopularity added much to its subsequent advancement, and the members hope that Mr. Little will be speedily restored to health and spared for many more years of usefulness in the battle for better forestry methods.

Moved by Chancellor C. C. Jones, seconded by Mr. Ellwood Wilson and Resolved: That the trustees of the Carnegie Public Library be accorded the thanks of this Association for their kindness in placing at its disposal for the annual meeting the lecture hall and committee room of the Library.

Mr. F. C. Whitman, Annapolis Royal, N.S., President Canadian Forestry Association, 1915-16.

Moved by Mr. G. C. Piché, seconded by Dr. Fernow, and Resolved: That Messrs. Frank Hawkins and T. E. Clendinnen be paid the sum of ten dollars each for their services as auditors of the Association in the past year and that they be and are hereby appointed auditors for 1915.

It was moved by Mr. A. C. Campbell, seconded by Mr. Thomas Faweett and Resolved: That this meeting expresses its condolence with the families of deceased members mentioned in the Directors' Report.

[illegible] explained that at the meeting of the Directors in the afternoon the Secretary, Mr. James Lawler, handed in his resignation, the same to take effect on [illegible], but that Mr. Lawler had agreed to carry on the routine work of the Association until a new Secretary was appointed.

Mr. Lawler explained that he left the work with regret. He spoke of the harmony that had always existed between himself and the Board and thanked the Directors and past Presidents for the sympathy and support they had always accorded him.

The resolution passed by the Board of Directors dealing with this matter in the afternoon, given in another part of this issue, was read to the meeting.

Mr. R. H. Campbell, convener, presented the report of the Nominating Committee and the same was adopted by the meeting, upon motion of Mr. Campbell, seconded by Mr. Wilson. This report nominated for election the officers for 1915-16 as they appear in the list on the front page of this issue. It was the desire of the Committee to nominate Mr. William Power, M.P., to the Presidency for another year but while unable to be present, owing to a trip to England at an earlier date than expected, Mr. Power had sent word that he was unable to accept the office for the coming year. Mr. F. C. Whitman, of Annapolis Royal, N.S., was elected President and Lt.-Col. J. B. Miller of Toronto, Vice-President. The only other changes were in the list of Territorial Vice-Presidents where owing to changes in the Ministry of Lands and Forests in each case, Hon. G. Howard Ferguson was elected Vice-President for Ontario to succeed Hon. W. H. Hearst, and Hon. Geo. J. Clarke, Vice-President for New Brunswick, to succeed Hon. J. K. Flemming.

It was moved by Mr. J. B. White, seconded by Mr. R. H. Campbell, and Resolved: That the thanks of this Association be accorded the retiring President, Mr. William Power, M.P., for the very valuable services he has rendered to this Association. Up to the time of the outbreak of the war Mr. Power looked forward with great interest to the holding of the Halifax Convention, and made a careful enquiry into the peculiar needs and conditions of that province. The necessity of giving up the Convention because of the war was a great disappointment to him. It was the desire of the Association that Mr. Power should hold office for another year but he was unable to accept the office.

In presenting this resolution, which was warmly applauded, the mover pointed out that the war came very close home to Mr. Power in that he had two sons serving in

the First Canadian Expeditionary Force where no one doubted but that they would render good service to the Empire.

The meeting then adjourned.

THE SECRETARYSHIP.

Committee at Work to Find the Right Man For the Post.

At the meeting of the Directors of the Canadian Forestry Association on the afternon preceding the annual meeting the Secretary read a letter tendering his resignation, asking that it take effect on January 31st. He explained why the notice was so short and stated that until a successor was appointed he would continue to carry on the routine work of the office.

It was moved by Mr. Gordon C. Edwards, seconded by Mr. A. S. Goodeve: That this Board of Directors learn with regret of the decision of Mr. Lawler to resign his position as Secretary. They recognize the energy and ability with which he has carried on the work. They appreciate his offer to continue to perform the duties and carry on the work until his successor is appointed. They accept his resignation and wish him every success in his new position. They further suggest that the Directors resident in Ottawa be a committee to recommend the appointment of a new Secretary.

After some discussion this was amended to read that the committee be composed of Messrs. Gordon C. Edwards, Goodeve, Campbell, Leavitt and D. Murphy, and being put to the meeting the resolution as amended carried.

The Special Committee thus appointed met on Feb. 8 and elected Mr. Denis Murphy Chairman. They instructed Mr. Lawler, who continues to act as Honorary Secretary, to send out a letter of information to those desiring to become candidates for the position. A draft of this letter was approved.

The Committee decided that the first consideration was to get the right man and other things would be subordinated to that. While it will not allow the post to remain vacant an undue length of time it will, in pursuance of the above policy, proceed with deliberation.

Several applications have been received, and these will be considered by the Special Committee at its next meeting.

Those who desire information as to the work and possibilities of the office with a view to becoming an applicant, or of suggesting the name of a suitable person for the position may address the Honorary Secretary, Canadian Forestry Association, Journal Building, Ottawa.

TAPESTRY TREES.

OAK. I am the Roof-tree and the Keel:
I bridge the seas for woe and weal.

FIR. High o'er the lordly oak I stand,
And drive him on from land to land.

ASH. I heft my brother's iron bane;
I shaft the spear and build the wain.

YEW. Dark down the windy dale I grow,
The father of the fateful Bow.

POPLAR. The war shaft and the milking-bowl
I make, and keep the hay-wain whole.

OLIVE. The King I bless; the lamps I trim;
In my warm wave do fishes swim.

APPLE TREE. I bowed my head to Adam's will;
The cups of toiling men I fill.

ORANGE TREE. Amidst the greenness of my night
My odorous lamps hang round and bright.

FIG TREE. I who am little among trees
In honey-making mate the bees.

MULBERRY TREE. Love's lack hath dyed my berries red
For Love's attire my leaves are shed.

PEAR TREE. High o'er the mead-flowers' hidden feet
I bear aloft my burden sweet.

BAY. Look on my leafy boughs, the Crown
Of living song and dead renown!

—*William Morris.*

Rules for Care With Fire in the Woods.

1. Be sure your match is out before you throw it away.
2. Knock out your pipe ashes or throw your cigar or cigarette stump where there is nothing to catch fire.
3. Don't build a camp fire any larger than is absolutely necessary. Never leave it, even for a short time, without putting it OUT with water or earth.
4. Don't build a camp fire against a tree or log. Build a small one where you can scrape away the needles, leaves or grass from all sides of it.
5. Don't build bonfires. The wind may rise at any time and start a fire which you cannot control.
6. If you discover a fire, put it out if possible; if you can't, inform the nearest Forest Ranger or Fire Warden as quickly as you possibly can.

Forestry Matters before the Commission of Conservation.

Forestry Leaders Deal With Different Aspects of the Subject.

The sixth annual meeting of the Commission of Conservation of Canada was held in the offices of the Commission, Ottawa, January 19 and 20, 1915, with most of its members from the different provinces in attendance.

Sir Clifford Sifton, Chairman, presided and delivered the opening address. In beginning he noted that Dr. Beland, M.P., one of the members of the Commission, was taking an active part in caring for the wounded in Belgium and was at that date a prisoner in the hands of the enemy. Reference was also made to the fact that Col. Jeffrey Burland, of Montreal, who was a member of the Town Planning Committee of the Commission, had died suddenly in England, where he had gone as Chief Commissioner of the Canadian Red Cross Association. His place had been taken by Dr. Hodgetts, Chief Medical Adviser of the Commission, and his work in Canada had temporarily to be abandoned.

Sir Clifford Sifton's address dealt with town planning, agriculture survey, illustration farms, minerals, power survey, fisheries, game and fur-bearing animals, use of western coal, game preservation, in addition to forests.

It was noted, however, that much of the work of the Commission this year related to forestry showing the growth in importance of this subject, and synopses of several of the addresses delivered will be found below.

SIR CLIFFORD SIFTON.

The Chairman Shows Where Progress is Being Made.

Sir Clifford Sifton began with the assertion that the fire season of 1914 was the worst since 1910 and had it not been for the protective organizations, established during the last three years, the loss might have approached the dimensions of a national disaster. Larger appropriations were needed to make the service still more effective. Fire protection must be regarded, not as an expense, but as an investment, which would pay high dividends in the future.

A general stock-taking of Canada's forest resources was urgent in order to provide for intelligent conservation. This work, begun in British Columbia and Saskatchewan in 1915, [illegible]. It was hoped another year would complete the survey when a report would be published. The low cost of the work, only six

Sir Clifford Sifton.

cents per square mile, was explained by the large amount of data obtained from the Dominion, Provincial and C. P. R. Forestry Branches, and many limit holders.

It had, so far, been shown that in the 27,000 square miles of Saskatchewan, accessible by present logging operations, there are 2,100,000,000 feet, board measure, of spruce saw timber. Incomplete data for the other 33,000 square miles indicate a total stand of 1,200,000,000 feet. Adding to these another 88,000 square miles, north of the Churchill river, the rough total for the whole of Saskatchewan might be given at 3,500,000,000 feet. Tak-

ing as a basis the averages found in Saskatchewan, the spruce of Manitoba might be estimated at 2,500,000,000 feet and that of Alberta at 6,000,000,000 feet, making a total of 12,000,000,000 feet for the Prairie Provinces.

While these figures indicated a depleted condition since the advent of the white man, Sir Clifford maintained that, with adequate protection from future fires, these great areas would re-establish their timber wealth.

It was only partially true that nature alone provided for the replacement of valuable commercial forests. The work of Dr. Howe in British Columbia showed that the burning of logging slash, at selected times and under proper supervision, not only reduces the fire hazard, but favors the reproduction of Douglas fir, by exposing the mineral soil. Reproduction of valuable species could be obtained at slight expense by providing more adequate protection from fire on cut-over lands.

Under the fire regulations of the Railway Commission, steady improvement had taken place in fire protection along railway lines in which work the railways were co-operating. The Railway Commission had established co-operation with governmental fire protective organizations in all of the forest provinces, except Nova Scotia. In that province, active co-operation would follow the appointment of a provincial forester, for which provision had been made by law. The situation would benefit greatly by the early appointment of a qualified man to the position.

Much had been gained by the fact of several provincially chartered railways becoming subject to the Railway Commission's regulations. The International Railway of New Brunswick, being absorbed by the Intercolonial, emphasized the need for the adoption of the same fire measures on Government lines as were required on others. No action had yet been taken on the Conservation Commission's resolution of last year, urging that the Government lines be placed under the Railway Commission, in the matter of fire protection. The management of the Intercolonial should repeat, prior to April 1st, 1915, the special instructions issued the past two summers relative to reporting and extinguishing fires.

The presence of large quantities of inflammable debris on Crown and private lands, near rights of way, was a serious handicap to the fire protective efforts of railways. While further legislation was needed on this matter distinct progress had been made in individual cases, during the year. The provincial authorities of British Columbia had issued instructions requiring the burning of slash, resulting from new public road construction, and cleaning up old slash, while Ontario, also, seemed to have provided for the disposal of road slash, particularly near railways. The Grand Trunk and Ontario Provincial authorities were sharing, equally, the cost of removing inflammable debris from the danger zone along the railway through Algonquin Park. Similar work was done by the Department of Indian Affairs along the C. P. R., through the Shawanaga Indian reserve, in Muskoka.

Material additions had been made to the Dominion Forest Reserves in Saskatchewan but there were large areas in all the Western Provinces which should be included in permanent reserves. The total area of Dominion forest reserves and parks in Western Canada now stood at 43,801 square miles.

Sir Clifford urged that the merit system be substituted for the patronage system of appointments to the field service of the Dominion Forestry Branch and strongly supported the Canadian Forestry Association on this issue. It was the most urgently needed reform at the present time.

There was practically a complete divorce between the theory and practice of forestry on Dominion lands. While the Forestry Branch was well equipped with technically trained men, it had no connection with the administering of cutting regulations on the licensed timber berths, while the Timber and Grazing Branch, which administered the regulations and collected the revenue on licensed timber berths had not, so far as was known, one man trained in forestry.

Ontario now had 22,574 square miles of forest reserves and parks. Millions of acres, cut over or burned over, were without fire protection. If the present annual revenue of $2,000,000 was to be maintained the merchantable areas and young growth would have to be protected, under a definite policy, such as placing a definite area under protection each year. The addition, last year, of 2,000 square miles to the Mississaga reserve and 811 square miles to the Algonquin national park was an excellent step.

In regard to the Trent Watershed, Sir Clifford urged that the Dominion Government purchase the fairly contiguous portions of the 176,000 acres of unlicensed Crown lands and place them under the Dominion Forestry Branch; or an arrangement might be made for acquiring them free from the Province of Ontario. It would also be a paying investment from the direct sale of forest products in the future.

Sir Clifford commended the formation of forest protective associations of which there were now two in Quebec covering the St. Maurice Valley and the Lower Ottawa.

MR. R. H. CAMPBELL, DIRECTOR OF FORESTRY.

The Year 1914 Compared With 1910.

Mr. R. H. Campbell, Dominion Director of Forestry, contending that fires would continue for some years to be the great enemy of forests in Canada, compared the year 1914 with the nearest previous dry year, 1910. In 1910, 1,227 fires were reported, on Dominion territory, covering 346,000 acres and burning 185,250,000 feet, board measure, of merchantable timber. One continuous fire in the foothills of the Rockies covered 494 square miles. The number of rangers on the reserves was 20 and outside, 107. Then, on the reserves, such improvements as roads and trails had only been begun and there was no thorough system of inspection along railways.

Mr. R. H. Campbell.

In 1914, 1,406 fires were reported over an area of 438,567 acres, destroying 350,000,000 feet of lumber. The staff on the reserves had increased to 142 and their whole efforts were strained. (The area had increased from 2,725,360 acres to 23,024,640 acres). The result in 1914 seemed worse than in 1910, in spite of improvements in roads and equipment, but this was due to two bad fires in the Rockies, where the road and trail system had not been worked out and which accounted for four-fifths of the damage.

Of the known causes of forest fires, settlers took first place, especially outside of reserves; railways followed closely and [illegible] how improvement should be worked out.

In 1910, the roads and fire guards amounted to only 144 miles. There were now 300 miles of roads within the reserves, 1,249 miles of trails, 500 miles of fire guards ploughed, 400 miles of fire guards cut and 200 miles of telephone lines. An improvement in the trails was accomplished by carrying out a system of primary, secondary and third class trails, the first of these being main lines and as well built as the roads. Telephone service, which is very effective, was brought to the highest point of efficiency on the Riding Mountain reserve in Manitoba, where it reaches every ranger district. In the last year or two the lookout tower system had been established to the number of eighteen. Another big improvement over 1910, when every ranger lived outside the reserve, was that, now, practically all live on the reserves. Some 27 houses and 63 cabins were built for this purpose. Again, in 1910 the patrol carried out along railways, in operation and under construction by the Department, was almost the only protection against fire. Now, not only has the system by the forest service, under the chief inspector of the Dominion Railway Board, been well developed, and a special staff appointed for it, but the regulations of the Board have been much more thorough and responsibility has been placed on the railways. The results for the year on most of the lines were gratifying.

But no mechanical aids could take the place of the proper spirit among the men engaged in the work. And the spirit displayed by the staff was better than in 1910. The work was more intelligently directed, with better results. An example of conscientious work was afforded in the case of one ranger, who though ill with dysentery and living on water alone, fought fire three days and three nights, continuously.

Mr. Campbell concluded by mentioning four things which he considered essential to an adequate forest policy:

1—Development of the forest [illegible] policy to include all non-agricultural lands and completing the fire protective service.

2—Teaching the value of the forest from the business point of view. The forest had been regarded too much from the romantic or aesthetic side.

3—Infusing the proper spirit of public service into the organization. Officers whose duties were of a permanent nature should be ensured that if they did their duty efficiently they would be continued in service.

4—Legislation should be provided by the other provincial governments, similar to that in force in British Columbia, giving

fire rangers control of the setting of fires for the clearing of land.

MR. G. C. PICHE.

Progress of Quebec Forest Service.

Mr. G. C. Piché, Chief of the Quebec Firest Service, traced the growth of the Forest Service of Quebec, started in 1909, with an expenditure of $55,000. The staff then comprised two forest engineers, three civil engineers, 15 student assistants and 80 rangers. In 1915, the estimated expenditure was $100,000, with a staff of 20 forest engineers, two civil engineers, 15 expert scalers or special agents and 80 forest rangers. In order to recruit the technical men needed a forest school was

Mr. G. C. Piché.

established in 1910 at Quebec. The government employed 18 of the 26 forest engineers, graduated from the Laval Forest School. The next step would be a ranger school to train men, not only for the government, but for lumbermen.

Quebec had 130,000,000 acres of forest area of which 45,000,000 acres were leased to limit holders; 5,000,000 acres belonged to private owners and the remaining 80,000,000 acres were in virgin forest. Co-operation with private holders so as to place their woodlots under a permanent system of exploitation was desired in addition to the reforestation of waste lands. The forest nursery at Berthierville had been increased to meet the big demand which had arisen for seedling trees for the replanting of farmers' woodlots.

Timber lands were being protected from land speculators getting them under cover of colonization. During the last year 500,000 acres had been examined and classified so as to place limit holders in a more certain position.

On the south shore of the St. Lawrence reserves had been created where no sales will be made for ten years. Following an exploration of 8,000 square miles of vacant lands, timber limits were sold, last October, bringing a higher bonus than at any former sale.

In pulp districts, operators are found to be cutting stumps low and tops small to a degree not thought of in 1909. To encourage this more, it has recently been decided to rebate 50 per cent. of the stumpage due for all logs, less than six inches in diameter at the small end.

Insect attacks had been slight but there was a reduction in the reproduction of balsam fir and spruce by the defoliations of the spruce bud worm. Shifting sands were a menace in many sections, due to bad cultivation, sandy waves covering good soil. To combat this, temporary cover with beach grass was very effective and 150 acres were so treated at Lachute. Fifty more acres were replanted with white pine, Scotch pine, spruce and green ash. At Berthier Junction another planting experiment, begun last autumn, would be continued in the spring.

Fire protection had been well executed by Mr. W. C. J. Hall, with a small staff, and by the lumbermen in such excellent organizations as the St. Maurice Valley Forest Protective Association and the Lower Ottawa Forest Protective Association.

Mr. Piché expected to see the present cut of one billion feet from the forests, under license, greatly increased, by scientific methods without undue drain on the forest.

MR. H. R. MACMILLAN.

The Real Object of Forestry.

Mr. H. R. MacMillan, Chief Forester of British Columbia, urged an educational campaign to dispel public apathy, founded on ignorance, with regard to forests. Canada had not progressed as far as might be expected of a people so dependent on forests. Extension of forest administration was opposed by many misinformed people who regarded it largely as a sentimental movement to prohibit the cutting of trees; by others who regarded it as an expenditure of much government money in plant-

ing and cultivation of forests, an expenditure which could never be repaid. And even among those connected with the lumber industry a misconception existed that forestry meant the importation from Europe of absurd regulations that would hamper and restrict operations.

On the contrary, good forestry policy expected that timber should be cut wherever, and wherever, there was a market for it. No expenditure should be made for fire protection that would not be returned by production.

The British Columbia Forest Branch had demonstrated that forestry regulations were not burdensome to operating com-

Mr. R. H. MacMillan.

panies. Several hundred million feet had been sold to loggers, during the past two years, under regulations requiring such disposition of slash as would prevent dangerous fire hazard and encourage the regeneration of the forest.

Every acre should be made productive by producing either agricultural or timber crops. South of the 60th parallel, about 69 per cent. of the area of Canada was unsuited for agricultural crops, but would yield merchantable timber. At present, forest industries supply 12 per cent. of the foreign trade, 16 per cent. of railroad traffic and equalled, in value, the annual wheat crop. Should these valuable industries perish for want of raw material or should they be perpetuated by protecting mature timber from fire, encouraging young forests and logging so as to help reproduction? Yet, people saw no asset in non-agricultural logged areas and burned-over lands.

New Brunswick was now cutting more than the annual forest growth on Crown lands. All merchantable forests in Eastern Canada would rapidly be wiped out on account of the increasing foreign demand for the products. Yet on three-fifths of the whole area the forest industry was the only suitable one. It could be maintained only by producing timber on the logged-over and burned-over areas. These lands were not wastes but needed only fire protection to enable them to support logging camps, pulp mills and republic communities.

Thus the practice of forestry in Canada was imperative as an economic measure. In every province the timbered and non-agricultural Crown lands should be studied in order that protective and administrative measures might be adopted with a full knowledge of the products to be derived. The experience in British Columbia was that the best results were obtained, at the least expense, where one organization was responsible for the necessary forest study and fire protection as well as the timber administration.

DR. B. E. FERNOW.

Organization Methods in Forest Service.

Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto, advanced the motto, "In time of war, prepare for peace," as a forestry policy. Three suggestions in the report of the Committee on Forestry might be accentuated. These were: re-organization of the administrative offices dealing with Dominion timber lands, expansion of the scientific work of the Dominion Forestry Branch and bringing the Trent Watershed under Dominion management.

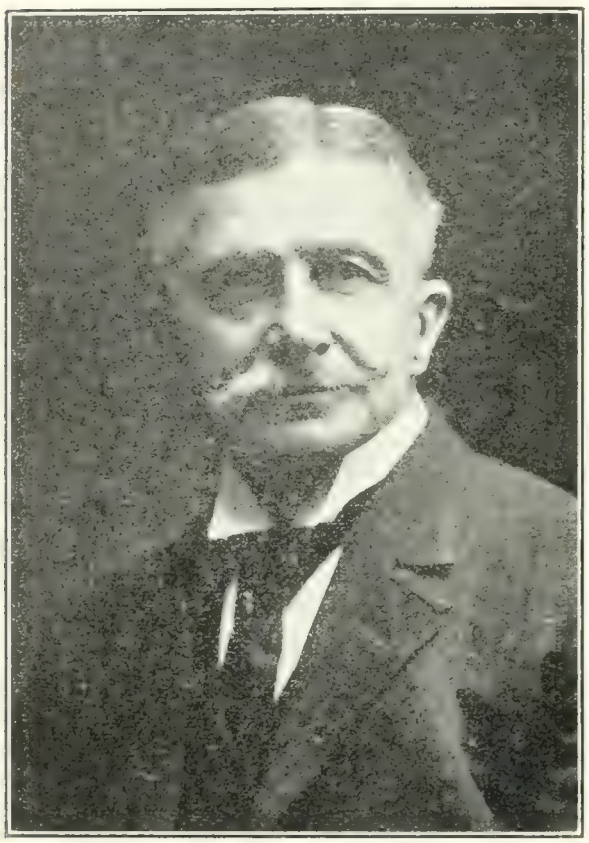
It was an incongruous condition to have three separate government branches divide authority over the public timberlands. There were the Timber Branch, in charge of licensed timber limits; Forestry Branch, in charge of forest reservations, exclusive of the timber limits, previously licensed; Parks Branch, in charge of all the other portions of the timber area.

The Forestry Branch had been instituted presumably to bring into the administration technical knowledge to be utilized to insure continuity of the timber resources. Yet all or nearly all the timber lands which can be used for the next fifty years were withdrawn under licenses from its direct influence. They were being cut over without technical supervision.

In the case of the commercial timber areas, the division of authority between the Forestry Branch and the Timber Branch led frequently to friction and un-

economic procedures. A rational arrangement, which could be afforded without much upheaval, would be to place, at least, those limits within the reservations, wholly under the Forestry Branch.

The Forestry Branch should be made independent of political changes. With an organization of trained and permanent men and an extension of the functions of the Branch, the problems of silviculture



Dr. B. E. Fernow.

could be systematically studied. In Canada, the most fundamental knowledge of the biology of our tree species, upon which their silviculture is based, was lacking. Volume tables to aid timber estimating and yield tables for calculating the results of silviculture were also lacking. All of these the Forestry Branch could be equipped to furnish.

Dr. Fernow referred at considerable length to the Trent Watershed and his estimates in regard to this will be given in the next issue.

The Canadian Engineer is the authority for the statement that oil-burning locomotives will be used by the Grand Trunk Pacific Railway, according to a statement made in an official interview, on its transcontinental route. Oil storing facilities are now being prepared.

Mr. James White, Deputy Chairman, Commission of Conservation.

Mr. Clyde Leavitt, Forester Commission of Conservation.

An effort is on foot to create a forest reserve in the Mount Kathadin section of Maine.

Canadian Forestry Association

Directors' Report for 1914.

While the war has been the dominating force in the year the work of the Canadian Forestry Association has proceeded as steadily as possible under the conviction that such necessary work as protecting our forests, the basis of such a large proportion of the wealth of the country, should not be allowed to lag. When the war ceases the Association hopes to again turn the attention of all citizens to this most important question. To this end it is desired that the activities of the different departments be maintained.

Convention Not Held.

At the annual meeting of 1914 it was decided to hold the convention in Halifax, and the Secretary made preparations for this, in which he was assisted by the President, Mr. Wm. Power, M.P., and especially by the Vice-President, Mr. F. C. Whitman. The latter met the Secretary in Halifax in February and arranged matters with the Provincial Government and the local authorities, and in March visited Ottawa, where at a meeting of Directors it was decided to hold the convention Sept. 1 to 4. Later the Vice-President mapped out a series of meetings in fourteen different places in Nova Scotia, where in the months of June and July the Secretary delivered illustrated lectures and explained to the leading citizens the objects and scope of the convention.

At a majority of these meetings the Secretary was assisted by Mr. B. R. Morton, B.Sc.F., the officer in charge of Woodlots of the Dominion Forestry Branch, who at the same time was making an investigation of forest conditions in the province. At two of the meetings the Vice-President was able to be present, and during the whole trip he was constantly in touch with the Secretary by telephone. It was hoped that Mr. J. B. Whitman, Deputy Minister of Crown Lands for Nova Scotia, would be able to accompany the Secretary throughout the trip, but other unexpected duties prevented him from attending all but three of the meetings.

These meetings, extending as they did from Sydney on the east to Yarmouth and Annapolis on the west, aroused considerable interest, and this was furthered by the excellent reports given by practically all the newspapers.

About ten thousand people in Nova Scotia, timber lot owners and members of the agricultural societies, were given information by circular, and through the kindness of the Director of Forestry with these circulars were included Circular No. 10 of the Forestry Branch, being Mr. Morton's pamphlet on the Care of the Woodlot. These pamphlets are much appreciated by the farmers and the continued demand for them shows that there is now a very general desire to know how to handle the timber still standing on the farm.

After returning to Ottawa the Secretary continued the preparations for the convention until the outbreak of war, when the opinions of all officers and directors were taken and proved to be practically unanimous that the convention should be indefinitely postponed and all the existing arrangements therefor cancelled.

At a meeting of the Directors on Aug. 20 it was decided to postpone the convention indefinitely, to return the $400 contributed by the Province of Nova Scotia, and not to draw on the Vice-President for the $350 promised by the Lumbermen's Association of Nova Scotia. The postponement of the convention was the more regretted by the Directors as up to the outbreak of hostilities the meeting had promised to be one of unusual interest.

Dominion Forestry Congress.

At the annual meeting a deputation of members waited upon the Right Honorable the Prime Minister, Sir Robert Borden, and Hon. W. J. Roche, Minister of the Interior, and pressed upon them a number of resolutions dealing with the increase of forest reserves in the west, the extension of civil service regulations to the outside service, the afforestation of sand lands, fires from railways, tree planting, and commending the Government for establishing the Forest Products Laboratory. In the course of his reply Sir Robert Borden asked the Canadian Forestry Association to consider the question of the calling of a Forestry Congress by the Government. At the concluding session of the annual meeting the Association passed a resolution that it would

be advisable to call such a Congress for January or February of 1915, and appointed a committee to give the Prime Minister any assistance possible in this matter. This committee, of which Mr. A. S. Goodeve is chairman, met and drew up a series of suggestions for which they were thanked by the Prime Minister.

Just after the conclusion of the Secretary's trip in Nova Scotia a communication was received from one of the Prime Minister's secretaries stating that Sir Robert Borden was ready to take up the matter. The Secretary immediately wrote on behalf of Mr. Goodeve expressing the committee's willingness to act and asking for some necessary information upon which to begin. Before there was time to receive an answer to this letter hostilities had broken out and nothing further has been heard of the matter.

Pure Maple Products.

Toward the close of the 1914 regular session of Parliament the Secretary, upon the invitation of the Pure Maple Products Association of Quebec, attended a deputation which pressed upon the Minister of Inland Revenue greater strictness in the law regarding the sale of maple sugar and maple syrup. The deputation was successful in its object and it is now illegal to use the word "maple" in connection with any sugar or syrup which is not wholly the product of the maple tree.

Publication Work.

Other work of the Association has been carried on as actively as the circumstances of the year permitted. The Canadian Forestry Journal was issued nine times during the year, and reports of the work in French were sent month by month to the Journal d'Agriculture, Quebec. The report in French of the three latest conventions was issued in October and sent to a list of names throughout Canada, but chiefly in the province of Quebec. Notice of the issue of the same was sent to all French newspapers in Canada, and since that time there has been a steady demand for copies.

A number of bulletins have been issued as in past years, but greater attention was paid this year than ever before to the preparing of short individual articles for different newspapers and magazines. These articles have been very gladly received and given prominent positions, and sometimes illustrated by engravings. This is a feature of the work capable of great expansion. There is very little cost attached to it aside from the time necessary to prepare the articles.

Membership Details.

The income of the Association from members' fees was about $400 less than in 1913. This was caused by the fact that no convention was held, as a number of new members join at every convention, and because of the fact that, owing to war, it was not possible to carry on an autumn membership campaign. The number of new members who joined during the year was 263, and of those who resigned, died or were dropped for non-payment of dues, 304, leaving the membership 2,993.

While the circle of Directors has not been broken during the year the Association has lost an unusual number of its prominent members by death, the list including Mr. M. M. Boyd, Lt.-Col. Jeffrey H. Burland, Hon. Colin Campbell, Hon. Wm. Gibson, Mr. John Gillies, Mr. A. H. Hilyard, Hon. Robert Jaffray, Hon. J. N. Kirchhoffer, Hon. David Laird, Mr. H. H. Lyman, Mr. V. R. Marshall, Hon. F. D. Monk, Sir Geo. Ross, Dr. William Saunders, Lt.-Col. D. R. Wilkie and Sir William Whyte.

The Dominion Government and the Governments of the provinces of Ontario, Quebec and British Columbia have continued their grants, and some of the banks and lumber and pulp companies have subscribed for a number of officers. The Bank of Nova Scotia was added to the list of banks supporting the Association in this way.

The effect of the cancelling of the convention was that while most of the expenses for the same were incurred there was not the benefit to income accruing from a convention, while the war seriously interfered with our finances. In spite of these drawbacks the Association ends the year with a balance of about $600.

General Forestry Conditions.

Throughout Canada in spite of the war there has been continued progress in forest conservation. The season was, all over Canada, an unusually bad one for fires, and heavy losses are reported at different points. In the Maritime provinces and extreme eastern part of Quebec there was a fair amount of rain, but west of that to the Pacific coast drought conditions prevailed practically all through the season until snow came. But while there has, probably, not been such a bad fire season for ten years, on the other hand never before in the history of Canada were such determined efforts put forth to prevent and suppress fires. There are many weak spots in the different fire protective services in Canada, but the number of strong places is constantly growing larger.

Special mention may be made of the successful fights put up by the St. Maurice Forest Protective Association and the Lower Ottawa Valley Forest Protective Association. There has also been a notable improvement of the fire protection along railway lines, from which system of protection under the direction of the Railway Commission of Canada the Government railways are still excluded.

Additions to Forest Reserves.

Very considerable additions were made to the Dominion Forest Reserves in the western provinces. These additions were chiefly in Saskatchewan where 7,879 square miles of land unsuited to farming were added to the already existing reserves. It should be noted that this was a development for which the Association had pressed. The total areas now in forest reserves under the Dominion Forestry Branch are: Alberta, 12,462,720 acres; Saskatchewan, 6,195,200 acres; Manitoba, 2,606,080 acres; and British Columbia 1,759,360 acres, a total of 23,024,640 acres of reserves under the Dominion Government.

There have been some increases in the forest reserves in the different provinces, which according to latest figures obtainable now stand as follows: Quebec, 107,997,513 acres; Ontario, 14,430,720 acres, and in British Columbia under provincial jurisdiction, 2,474,240 acres. In the last named province, in addition to the above delimited reserves, all lands west of the Cascades bearing more than 8,000 feet board measure per acre and all lands east of the Cascades bearing over 5,000 feet per acre of merchantable timber are reserved from entry. In British Columbia the protection and administration of all timber-lands has been placed by statute under a forest board consisting of trained men.

Conclusion.

Before the war broke out the question of the supply of pit props and other mining timber in the Maritime Provinces was occupying the attention of the Dominion Forestry Branch. The cutting off of the supply of this timber and of poles by the closing of the Baltic resulted in a visit of commissioners from Great Britain. Whether or not a trade in these lines can be developed with Europe the incident draws attention to the increasing importance of timber lands of the Maritime Provinces.

In spite of the war the three Canadian forestry schools report almost the same number of students in attendance as last year.

So long as war lasts it will probably be impossible for the Association to inaugurate an aggressive campaign, but when war ceases two prime duties seem before it, one to recommence the work in Nova Scotia in order to assist in the solution of the peculiar problems of that province, and the other to forward the movement for a Dominion wide convention to take stock of the whole forest situation and to see what progress has been made since the National Forestry Congress of 1906.

Scientific Investigation Urged.

Mr. A. C. Macdonell, M.P., Urges Linking Up of Universities and Business—What the Dominion Forest Products Laboratories Are Doing.

Knowing the benefits which are to be derived from the application of trained knowledge to industrial problems, particularly as related to our rapidly developing and changing forest industry, the Canadian Forestry Association for a considerable time urged upon the Dominion Government the establishment of a Forest Products Laboratory. This advocacy was successful, and in 1913 Hon. Dr. Roche, Minister of the Interior, established such a laboratory under the Dominion Forestry Branch. For reasons of equipment and otherwise the laboratory was located at Montreal in connection with McGill University. It is no exaggeration to say that there are literally thousands of facts which Canadian lumbermen, pulp makers, paper makers, builders, railways, electrical tranmission companies, and manufacturers desire to know about Canadian timbers and woods. To take just one illustration: a large proportion of the trees in our forests are known as 'weeds' because no profitable use has been found for their wood. If certain trees could be used to make pulp and paper it would

greatly increase the supply of paper-making raw material in Canada. It is to such problems that officers of the Dominion Government Forest Products Laboratories at Montreal are addressing themselves, urged on by the needs and the requests of wood-users in all parts of the country. The Canadian Forestry Association welcomes support for this work, and a most encouraging speech, showing full appreciation of the situation, was made by Mr. A. Claude Macdonell, the progressive Member of Parliament for South Toronto, in the House of Commons on February 23. In this part of his speech Mr. Macdonell said:

Mr. Macdonell's Speech.

'I am going to refer for a moment, and this time with approval, to my friend *The Globe*. I see that *The Globe* has been advocating that the country be engaged in a propaganda of industrial research. That is not a new idea; in fact, it is an old idea in Canada, and it is older still in other countries. The idea is to invoke the aid and assistance of our universities and great seats of learning and knowledge and to send out to the world practical scientific men equipped with expert knowledge, to secure information in regard to manufacturing processes and to ascertain the location of markets, etc., with reference particularly to those products the supply of which hitherto has been in the hands of Germany and which is now available to any one who may be able to capture it. *The Globe* has been advocating that. Let me point out that in the University of Toronto they are now making anti-toxin for the relief of persons afflicted by diphtheria. It is a purely philanthropic work that is being done by university graduates, and is the beginning of what I trust will be a very large public enterprise in the near future. They are also manufacturing tetanus, an anti-toxin for the use of the Red Cross Society for the treatment of lock-jaw and things of that kind. The University, on the first small order, saved the Red Cross Society no less than $3,000. We have many opportunities of securing the business that has been thrown open by the dislocation of the trade which Germany formerly did with Canada and the rest of the world. All of which means that Canada will have either to supply herself from abroad with what she has heretofore purchased from enemy countries or make it herself, which is the preferable course to adopt.

'We must ascertain the entire quality and quantity of the products that we will require under the new conditions, so that we may supply ourselves with all these goods from this time forward, which means aggressive industrial research, so as to submit to capital and moneyed men the means of manufacturing what we need.

'Our universities turn out each year a large number of engineers, chemical engineers, doctors, doctors of philosophy, chemists, and highly trained men in the various arts and sciences. These are 'pure science men,' and should be devoted to 'applied science.' They should be turned to practical problems and their solution, for the benefit of the people. These men have been taught to believe that their objective in life was to be teachers, professors, etc. This should apply to some of them, but many of the abler men should go out into the world to investigate and direct for the betterment of human kind and thereby increase the amount of useful knowledge. This method of research is practical.

'There should be an established relationship between learning and industry. Laboratories of industrial research should be established at all great seats of learning and at our universities.

'We have precedence for that splendid work in many of the large institutions and foundations in the United States. I might refer to the Carnegie Institute at Washington, the General Education Board, the Carnegie Foundation, and the Rockefeller Foundation, all of which are performing a great public service by educating men scientifically and eqiupping them to take part in the industrial enterprises of the country. These institutions are endowed with hundreds of millions of dollars. I commend to the Government some such action as that which has been taken in many other countries in regard to the encouragement of scientific men to aid and assist in the technical application of the scientific knowledge which they have acquired at the universities in order to help to build up the manufacturing enterprises of the country.'

AT THE ANNUAL MEETING.

Among those in attendance at the annual meeting were:

Mr. George Burn, General Manager, Bank of Ottawa; Mr. C. Jackson Booth; Dr. George Bryce, Winnipeg; Dr. J. S. Bates, Montreal; Mr. W. J. Boyd.

Mr. R. H. Campbell, Director of Forestry; Dr. John M. Clark, Albany, New York; Mr. A. C. Campbell; Mr. Roy L. Campbell, Montreal.

Mr. T. W. Dwight; Mr. C. B. Dougherty; Mr. John Dixon.

Hon. Sydney Fisher; Dr. B. E. Fernow, Toronto; Mr. Thomas Fawcett.

Mr. A. S. Goodeve; Mr. G. S. Gutches, Prince Albert, Sask.; Mr. Arthur H. Graham.

Lt.-Col. J. W. Harkom, Melbourne, Que.; Mr. W. C. J. Hall, Quebec City.

Dr. C. C. Jones, Fredericton, N.B.

Mr. Clyde Leavitt.

Lt.-Col. J. B. Miller, Toronto; Mr. H. R. MacMillan, Victoria, B.C.; Mr. J. F. MacKay, Toronto.

Mr. G. C. Piche, Quebec City; Mr. W. Gerard Power, St. Pacome, Que.

Mr. D. B. Rochester; Mr. F. B. Robertson.

Mrs. N. C. Smillie, representing Montreal Women's Club.

Mr. Ellwood Wilson, Grand Mere, Que.; Mr. J. B. White, Montreal; Mr. H. Claughton Wallin.

Oils distilled from the needles of spruce and fir trees are being used to scent petroleum floor oils, which are sometimes objectionable on account of their odour.

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Canadian Forestry Journal

VOL. XI. OTTAWA, CANADA, MARCH, 1915. NO. 3

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Patricia:—His Honor Sir Douglas Cameron.
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EDITORIAL.

His Royal Highness the Governor-General has graciously consented to act as Patron of the Canadian Forestry Association for the year 1915-16.

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines for Ontario, and Hon. George J. Clarke, Minister of Lands and Mines for New Brunswick have accepted office as Provincial Vice-Presidents of the Association for Ontario and New Brunswick, respectively.

So many relatives and friends of members of the Canadian Forestry Association are now on the firing line in Europe, or on the way thither, that no excuse is made for including an announcement from the Postmaster-General in regard to letters addressed to men at the front. The first announcement is that the ordinary rate per ounce on letters going to the United Kingdom will apply to letters addressed to Canadian and British troops on the Continent, in-

stead of the 5 cents per ounce rate prevailing ordinarily to continental Europe. The second announcement is that in order to facilitate the handling of mail at the front letters should be addressed as follows:

(a) Rank.....
(b) Name.....
(c) Regimental Number.....
(d) Company, Squadron, Battery or other unit.....
(e) Battalion.....
(f) Brigade.....
(g) First (or Second) Canadian Contingent.....
(h) British Expeditionary Force.....

Army Post Office,
LONDON, ENGLAND.

A meeting of limit holders representing territory in the Upper Ottawa district in Quebec was held at the Chateau Laurier, Ottawa, on March 15 when the matter of forming another forest protective association was discussed at length. The idea of the promoters was to unite the holders of timber limits stretching westward from the territory covered by the Lower Ottawa Forest Protective Association as far north and west as might conveniently be handled by one association. At the conclusion of the meeting a committee was appointed to go fully into the matter and to report at a later meeting.

Reference is made in another part of this issue to a number of the employees of the Dominion Forestry Branch and the British Columbia Forestry Branch who have enlisted for active service in the war. This is true of all institutions in Canada. How deeply interested the Canadian Forestry Association is in the progress of the campaign is shown by the fact that a number of relatives of Directors are at the front or are preparing to go with the second or third contingents. Just how many these are is not known but, accidentally, the following facts have been learned: The ex-President, Mr. William Power, M.P., has two sons officers in the first contingent now in France; the son of Mr. William Pearce, Calgary, is now in France; a daughter of Mr. A. S. Goodeve was one of the first to be accepted on the corps of nurses sent out and she is now in France, while a son is preparing to go with the second contingent; Col. George P. Murphy of the Canadian Army Service Corps is the son of Mr. Denis Murphy, and Lt.-Col. C. M. Edwards, in command of the 38th, is a nephew of Senator W. C. Edwards and brother of Mr. Gordon C. Edwards. Besides this we have new evidence every day of the large number of relatives of members who have enlisted for active service.

WOODNOTES.

When the pine tosses its cones
To the song of its waterfall tones,
Who speeds to the woodland walks?
To birds and trees who talks?
Caesar of his leafy Rome,
Where the poet it at home.
He goes to the riverside—
Nor hook nor line hath he;
He stands in the meadows wide,—
Nor gun nor scythe to see.
Sure some god his eye enchants:
What he knows nobody wants.
In the wood he travels glad,
Without better fortune had,
Melancholy without bad.
Knowledge this man prizes best
Seems fantastic to the rest:
Pondering shadows, colors, clouds,
Grass-buds and caterpillar-shrouds,
Boughs on which the wild bees settle,
Tints that spot the violet's petal,
Why Nature loves the number five,
And why the star-form she repeats:
Lover of all things alive,
Wonderer at all he meets,
Wonderer chiefly at himself,
Who can tell him what he is?
Or how meet in human elf
Coming and past eternities?

—*Ralph Waldo Emerson.*

THE ELM.

The elm in all the landscape green,
Is fairest of God's stately trees;
She is a gracious mannered queen,
Full of soft bends and courtesies.—*Smith.*

The Relation of Forestry to the Development of the Country.

Description of Some European Forest Conditions by Mr. R. H. Campbell, Dominion Director of Forestry.

While on a visit to the Old Country recently I had the opportunity of visiting Sir William Schlich, the head of the Forest School at the University of Oxford. Dr. Schlich is the oldest forester now in England and has had the longest experience in forestry work. He had the honor, with Sir Dietrich Brandis, of organizing the forest service in India and spent twenty-five years in that service. He then returned to England to the forest school which was then located at Cooper's Hill at which the forest students for the Indian service were educated, and has since been engaged in preparing men for the Indian forest service, which requires very high technical qualifications in its officers. Within the last few years the forest school was moved to Oxford and is now being carried on in connection with the University. Sir William is still active and able to attend to his work in the school and deliver lectures, although he is beginning to feel the effects of age. Sir William has since the inception of the forestry work in Canada taken a very keen interest in it, and was very much pleased to learn of the progress that is being made.

Mature Scotch Pine, Ballochbuie Forest, Scotland.

Dr. Schlich Discusses Forestry Situation in Canada.

Dr. Schlich was kind enough to discuss the Canadian situation somewhat fully, and after doing so he advised me that the best policy to follow was to have forest reserves established wherever there were lands suitable for that purpose, and then go forward and develop a permanent policy of administration on these reserves. This was the policy followed in the development of forestry work in India, and from Dr. Schlich's experience he was satisfied that this was the important basis for any advance in forest management in Canada. A statement of this kind from a man of Sir William Schlich's long experience both in forest management and in education, is

of great value and should give the foresters in Canada much more confidence in advocating the policy of setting apart forest reserves which has already to a considerable extent been advocated and adopted.

Progress Being Made in Setting Apart Forest Reserves.

Considerable advance has been made in Canada in the setting apart of forest reserves. At the present time there are forest reservations throughout the Dominion as follows:

	Acres.
Quebec	107,997,513
Ontario	14,430,720
Manitoba	2,606,400
Saskatchewan	6,195,705.6
Alberta	16,813,376
British Columbia (in Railway Belt)	2,417,638.4
British Columbia (outside Railway Belt)	2,474,240

making a total of 152,935,593 acres. Besides the areas given for British Columbia, all the lands west of the Cascades bearing more than 8,000 feet, board measure, of timber per acre and all lands east of the Cascades bearing over 5,000 feet, board measure, per acre of merchantable timber are removed from entry.

These areas have been selected with considerable care with the object of including in such reservations only lands which control watersheds, or which owing to the nature of the soil, topography or altitude, are not suitable for agricultural purposes. The determination of what lands are absolute forest lands and what are agricultural lands is a matter of great importance, and it is one into which a good many factors enter so that the decision that any land is absolute forest land may have to be altered with conditions of climate, or markets and of agricultural and forest development.

Agricultural Conditions.

In considering the possibilities of the use of land for agricultural purposes it should also be kept in mind that the idea is not as to whether it might or might not be possible to plough up the land and raise some sort of a crop on it or use it for grazing purposes, but whether the conditions are such that a family can be supported upon the land in ordinary decency and comfort. If such is not the case the placing of people on such lands is not only of no benefit to them but is an absolute detriment to the common weal as the result can only be the bringing up of a generation which will be a menace rather than a strength to the state.

In districts where the climate is sufficiently mild to permit of the growth of fruit, cultivation may be carried to higher altitudes than in cases where less profitable crops to the acre can be grown. In France and Switzerland, vineyards are found high up on the sides of the mountains on soil that is not of good quality and are making possible a profitable return from the land so as to largely provide for the support of a family on comparatively small areas. Where grain or root crops must be resorted to, the area of land required for the support of a family would be considerably greater, and where it reaches a point that only the grazing of stock and the growing of green feed is a possibility the area required for the support of a family must be largely increased.

On the poorer land and in the mountain districts of Europe it has been found possible to greatly extend the area of profitable settlement by providing an outside source of employment and profit to the agriculturists, and this has been done by covering the poor land with forest and clothing the mountainside with a crop of trees. If we take a typical mountain valley in any of the forested districts of Europe the matter will be found to work out somewhat as follows: In the lower part of the valley where practically any crops may be grown, the farmer can depend on the proceeds of the land he owns or has rented to provide for himself and his family. Proceeding higher up the valley small fields of grain alternating with pasture provide a rather inadequate support for the family, and higher up climatic conditions which make the land suitable only for grazing, except possibly only a few acres in the immediate bottom of the valley, make it necessary that only the grazing of stock, which is generally done on common pasturage, should be carried out while the small area of arable land in the bottom of the valley may supply feed for the stock for the winter and vegetables for the family.

It is found, however, that, if some profitable work can be provided in the winter for the families living in such valleys, the valleys will be able to support a considerably larger population than would be the case if the hill sides were bared and devoted wholly to grazing or attempts at agriculture. The contrast, from observation, between the forested and deforested valleys in the mountains is so great that a forested valley will support a population estimated at five times the number in a deforested valley in a mountainous district. It will be seen then that the forest is not opposed to agriculture but is a great assistance to it in places where the agricultural conditions are not the most favorable.

Scotch Pine. Height, 108 feet; girth, 11 feet 10 inches.

Forest Planting Helps Poor Lands.

While the agricultural settlements in mountain valleys have been referred to in the preceding paragraph the same thing applies to poor lands, especially sandy lands, which may not be of any great elevation. A very striking example of this is seen in the district of the Landes in southwestern France. The sands thrown up on the sea-shore in the vicinity of Bordeaux and southward drifted in on the farmyards and vineyards to the east, gradually covering and destroying these and resulting in a condition of sand hills or dunes moving slowly under the influence of the wind, with stretches of marsh between them. On these sand hills and marshes grew a scanty vegetation which provided pasturage for a few sheep which were looked after by the shepherds who have often been described walking over the hills and through the marshes on stilts watching their sheep and sometimes busily knitting in order to add to the value of their time. Agriculture was impossible in the district and this grazing which was very poor and carried but a small number of stock was all the use that could be made of this extensive and increasing sand area. In the year 1788 steps were taken by the French government to ascertain what could be done to improve conditions here, and a policy of forest planting was decided on with the result that these sand wastes have been almost entirely planted up with Maritime pine which produces a very valuable harvest of resin during the life of the tree while the wood afterwards is used for paving blocks in Paris, for props for coal mines in England and Wales, and for other purposes. In fact one part of the shortage of mine props in Great Britain at the present time is due to the fact that the supply could not be obtained from northern France on account of the scarcity of labor owing to the men having all been called out to join the army. It will be remembered that there was a deputation from the British government in Canada recently looking into the question of the possibility of obtaining a supply of pit props in Canada to cover the shortage from the Baltic as well as from France.

The effect on the population of this reforestation work is shown by the fact that in the parishes of La Teste and Cazeaux, in this district the population before re-

Pine Trees tapped for Resin near Bordeaux, France.

forestation was 1,600 and is now 14,000, and considerable areas have been brought under cultivation owing to the improved conditions resulting from the fixing of the sand dunes. It is no wonder that a marble monument as well as a bust in bronze have been erected in the district to M. Bremontier, who initiated this work.

Forestry in Scotland.

In the earlier history of Scotland it is probable that the greater part of the Highlands was covered with a tree growth known as the Grampian forest, and that the forest was destroyed over most of the Highlands by fire which may have been set in the later days for the purpose of clearing out some of the turbulent clans from the glens and thus enforcing a pacification which otherwise seemed impossible. As a matter of fact at the present time a very large proportion of the Highlands consists of heath-clad hills, with a very little of natural forest on the estates of some of the more prosperous land owners. In the days of the Highland clearances the glens were emptied of men in many places to make way for sheep and the grazing of sheep in the Highlands has been recently its most important industry. A careful study of the whole question of the relative value of grazing and forestry in the Highlands has been made in recent years and the deliberate conclusion has been reached that with land which will not rent for more than one shilling an acre for grazing sheep, or even up to three shillings, it is certainly much more profitable to put the land into forest, and those of the private owners who are in a position financially to do so are planting trees and turning such lands into forests as rapidly as they can overtake the work. A large part of Scotland is so situated that the grazing is really not of great value as it is reckoned in the Old Country where our western estimate of one head of cattle to 20 or 30 acres of land, and one head of sheep to about one-quarter of that area, would be considered as reducing the grazing value of the land so low as to make it worthless for any purpose.

The Royal Scottish Arboricultural Society, which includes many of the large land owners in Scotland, is urging strongly a general policy of reforestation for the highlands of Scotland of such lands as are non-agricultural and are not grazing land of high quality. The Arboricultural Society argue for their view of this question not only from the basis of the land being thus put to its most valuable use but also from the basis of developing an increased population on the land, making the people more comfortable and contented and possibly stopping some of the exodus to Canada which has proved such a great drain on the population of Scotland. The Arboricultural Society has regular excursions every few years to some of the European forests and its members have seen the effect on the development of population of a well regulated co-operation between

agriculture, grazing and forestry, and their recommendations to the government are based on well established grounds. When it is realized that it will take 1,500 acres for grazing 1,000 sheep and that probably one shepherd will be able to look after this flock, whereas in the developed forests of Europe at least one man to one hundred acres is required, it will be seen that the possibilities of increasing the population by the encouragement of forestry are very great.

Conclusion.

While an argument from the experience of Europe or Great Britain cannot be transferred to Canada without consideration of the different conditions it is quite clear from the study I was able to make during the past summer of this question in the Old Country that for the best development of a country both in industries and in population, it is necessary to have a proper balance between the agricultural, grazing and forest interests, and that these are not necessarily antagonistic but should be mutually helpful.

Fire Line on Sand Dunes near Bordeaux, France.

WIRE FENCING AND TREES.

Occasionally, in running wire fences, it is necessary to attach the wires to trees. In doing this, it is bad practice to use staples to attach the wire directly to the trees, thus ensuring that the wire will become overgrown and imbedded in the wood. Not only is the tree thereby ruined or injured but, further, it is impossible to remove the fencing without cutting either the wire or the tree.

A better way, protecting both the tree and the fence, is first to nail to the tree a strip of wood about four inches wide and one inch thick, of a length to suit the height of the fence. The wire fence can then be stapled to this strip. This will secure the fence and will not interfere with the tree growth.

TO SEEK NEW MARKETS.

Mr. H. R. MacMillan, Chief Forester of British Columbia, was in Ottawa recently and it is understood that he has been given leave of absence by the British Columbia Lands Department for a period of about eight months during which, on behalf of the Department of Trade and Commerce of Canada he will travel in the far east and near east with a view of finding new markets for Canadian and particularly for British Columbia timber. He sails in a few weeks from Vancouver and will visit Japan, China, India and Australia before returning. His movements in the near east will doubtless depend considerably upon the duration of the war.

MAKING KNOWN CANADA'S PLAY-GROUNDS.

The opportunities for outdoor recreations which nature has provided in the great national parks of Canada and the abundance and variety of her mountain scenery are vividly described in four illustrated pamphlets, recently issued by the Dominion Parks Branch of the Department of Interior, Mr. J. B. Harkin, Commissioner.

Mr. Harkin, in a booklet called *Just a Sprig of Mountain Heather,* treats the subject comprehensively. The title is suggested by the beautiful heather growing in Rocky Mountains Park, a sample of which is attached to each pamphlet, making it a pretty souvenir. The writer shows that the vast areas—six scenic parks and two animal parks—now established in Canada, insure the people, for all time, of a means of associating with nature in its wildest and grandest form. Not only this, but the revenue derived from tourists would make a satisfactory return from the money invested in the national parks. One of Mr. Harkin's examples, in support of this view, is that $40,000,000 a year is spent by visitors to the pine woods of Maine.

Glaciers of the Rockies and Selkirks, written by Dr. A. P. Coleman, Professor of Geology, Toronto University, is a scholarly work in simple but picturesque language. He takes the reader up the mountain slopes, describing nature's majesty as he goes, until the snowline is reached. The last trees are seen at 7,500 feet. In the western Selkirks, where the snowfall is 40 or 50 feet a year the timberline and snowline are about the same, but in the eastern Rockies, the snowline is 9,000 feet. Glaciers of Canada are retreating, says Dr. Coleman, either because of warmer climate or reduced snowfall. Many of the beautiful glaciers are easily accessible by tourists and every type of Alpine scenery can be found.

A fund of useful information for anglers is contained in Mr. S. C. Vick's *Classified Guide to Fish and Their Habitat in the Rocky Mountains Park.* Six varieties of game fish are found there and he mentions the lake trout of Lake Minnewanka, reaching sometimes 40 pounds, as the largest. The brook trout, introduced into the mountain waters from the Nipigon district, adapted themselves well. Mr. Vick relates many appealing stories of the vast fishing region—1,800 square miles of mountain lakes and streams. He refers to the mountain pony as a true friend of the traveller as he goes from lake to lake.

Some interesting facts regarding the Nakimu Caves are given in a pamphlet compiled chiefly from writings of A. O. Wheeler and W. S. Ayres. These caves are a feature of Glacier Dominion Park, B.C., and the Government is making them more accessible to the public. Thrilling descriptions are given of the hazardous work of exploring these marvellous caverns of the Selkirks, following the discovery of the series by Deutschmann in 1904. Mr. Ayres' opinion that the weird passages are the result of ages of erosion by the waters of the Cougar creek is not supported by Mr. Wheeler, who suggests seismic disturbances.

NOVEL FIRE NOTICE.

While considerable difference of opinion exists as to how permanent a fire notice ought to be, some holding that paper notices frequently renewed are the best form, most administrative officers have adopted buckram or cotton as the material on which to print notices to be posted up along trails in the forest warning travelers and campers to be careful in their use of fire. The Dominion Parks Branch, Mr. J. B. Harkin, Commissioner, has carried this idea of weatherproof posters a step further, and its most recent poster is of sheet iron, on which the warning notices are enamelled in letters of bright colors. At the top of the poster is a picture of a forest fire which attracts attention and at the same time enforces the truth of the warning given below. These notices are to be distributed throughout the Dominion Parks in the Rocky Mountains during the coming season. The idea is a novel one and the success of these notices will be watched with interest by forest administrators.

FLOWERS AND FORESTS.

The beautiful flower plots, which delight the traveller at stations along the Canadian Pacific Railway, are the development of an interesting experiment of 25 years ago. It was then Mr. N. S. Dunlop entered the employ of the C. P. R. As a school teacher he had learned the advantage of encouraging aesthetic qualities among people. Being very fond of flowers, he brought seeds to his little country school and enlisted the co-operation of the pupils in planting them. This was a rather bold innovation at that period. The teacher's artistic temperament earned for him only ridicule from the parents of the pupils and from neighboring school sections. The children were not enthusiastic, at first, but the zeal and persistence of their teacher soon won them over.

After a while the children became proud of their lovely flower plots and began to

imitate them at home. Then the parents were impressed. Before long the whole school section was dominated by a love for the beautiful and people drove miles to visit the school yard.

When Mr. Dunlop entered the C. P. R. he began on his own responsibility to interest station agents in flowers and bulbs. With four kinds of seeds from his garden he soon infused some of his fondness for floral display into the men scattered along the line. It was not long till the railway employees began to like the new feature of their work and demands poured in for seeds. The company found that the influence of the flowers had a favorable effect on the lives and habits of employees and that the public appreciated the lovely sights that greeted them at every station.

Out of this grew the C. P. R. Floral Department. It distributes each year 150,000 packages of seeds and 1,000,000 bulbs to employees, from the Atlantic to the Pacific. Mr. Dunlop has seen his welfare work, which had such a modest beginning, reach magnificent proportions.

Before the C. P. R. Forestry Department was organized Mr. Dunlop frequently represented the railway at forestry conventions and he still maintains a very lively interest in the subject. The above article illustrates the keen interest which the railways are taking in the welfare of the community and this interest has been extended to take in the great resources represented by our forests. This new attitude is a most striking and helpful sign of the times.

MAPLE PRODUCTS ADVANCING.

The following item, which appeared in Canadian papers on Feb. 22 speaks for itself:

"That the gift of Her Royal Highness the Duchess of Connaught of a box of maple sugar to every member of the first Canadian contingent has resulted in quite an unexpected boom to the industry throughout the Dominion is shown in a cable received from Lord Stamfordham, Secretary to His Majesty the King, notifying Her Royal Highness that the Canadian product is to be found not only on the Royal table but also in every hotel and large store in London.

"The Maple Sugar Association, through Hon. Joseph E. Caron, Minister of Agriculture in Quebec, and G. Boyer, M.P., Rigaud, and other manufacturers, has also sent an official communication to the Duchess thanking her for having fostered in this manner the industry and opened up such a valuable channel of trade. An engrossed address was to-day presented to Her Royal Highness on behalf of the association."

OBITUARY.

Mr. W. H. Rowley.

Mr. W. H. Rowley, president of the E. B. Eddy Co., Hull, Que., and an ex-president of the Canadian Manufacturers' Association, died suddenly in Toronto, on January 12th, from rupture of an aneurism. The deceased was born in Yarmouth, N.S., in 1851. During the first twenty years of his active business life, he passed through a very successful banking career. Then, in 1886, he reorganized the E. B. Eddy Co. and from 1906 till his death was its president and treasurer. He possessed great executive ability and was recognized throughout Canada as an industrial leader. His activities extended into several branches of philanthropic and church work. As head of the E. B. Eddy Company, few men were more vitally affected by forestry problems. Mr. Rowley did not always agree with others who pressed forward the work of forest conservation but his views were always his own and always vigorously and fearlessly expressed.

Mr. R. H. Alexander.

One of the most prominent figures in the forest products industry of the Pacific coast, and one of the warmest advocates of forest conservation in that section of Canada, passed from the scene when Mr. R. H. Alexander died suddenly of cerebral hemorrhage at the residence of his son, Mr. F. W. Alexander in Seattle on January 29 last. Mr. Alexander was in his customary health and had been in attendance at a gathering of lumbermen in Seattle the day before he was stricken with his fatal illness. Mr. Alexander was so well-known and so much respected that the facts of his life have doubtless been read by many of our members in the daily papers and trade journals. At the same time it is impossible not to say a few words about one whom the cause of forest conservation can so ill afford to spare. Mr. Alexander was born in Edinburgh, Scotland in 1844, and, coming to Canada after he had completed his education in his native city, he, in 1862, nearly a quarter of a century before the first Canadian transcontinental railway was built, made his way overland to the Pacific coast by way of Tete Jaune Cache and the Fraser River. How Mr. Alexander became one of the pioneers of the lumber industry on the coast and how in connection with Mr. John Hendry, Mr. David McNair and Mr. C. M. Beecher he assisted in the building up of the great company with which he was connected at the time of his death is all well-known, but, perhaps, it is not so well-known that in the midst of an exceedingly busy career he found time to

take up the duties of a public man as a member of the city council, board of trade, school board and pilotage board. At the time of the great fire which swept the infant city of Vancouver off the map in 1886 the Hastings Mills gave shelter to hundreds of homeless people in their sheds and yard buildings and before the ashes were cool the company's teams were delivering lumber to build shacks for temporary shelter.

At the time of the Canadian Forestry Convention in Vancouver in 1906 and likewise in the meeting in Victoria in 1912 Mr. Alexander took an active part and aided much in making these conventions successful. Mr. Alexander's loss is keenly felt and by none more than by workers for the cause of forest conservation.

Four children survive—R. H. H. Alexander, the well-known Vancouver lumberman; Fred. W. Alexander, secretary of the Pacific Lumber Inspection Bureau, Seattle; H. O. Alexander, of Vancouver; and Mrs. J. L. G. Abbott, also of Vancouver.

FIGHTING FOREST INSECTS.

Dr. C. Gordon Hewitt, Dominion Entomologist, in forecasting the work of the Branch for 1915 says in regard to insects affecting forest and shade trees:

"In view of the widespread character of the depredations of bark-beetles in British Columbia and the serious losses they are causing our investigations will be extended northward from the regions covered during the past two seasons. Further studies will be made in Stanley Park, Vancouver, B.C., on the insects responsible for the loss of so many trees in that natural reserve. It is also hoped that an opportunity will be afforded of studying forest insect conditions in the Peace River region from which we have evidence that would indicate the need of such an investigation. A complete study of the parasites of the spruce budworm which has been very abundant in eastern Canada during the last five years is being made and the work will be continued in conjunction with work on other parasitic insects in New Brunswick. It is also proposed to devote some attention to certain special insects affecting forest and shade trees in eastern Canada, such as the bronze birch borer, etc."

EXPORTING CHRISTMAS TREES.

Following is an extract from a letter from Mr. Sidney Downer of the Macleod Pulp Company, Liverpool, Nova Scotia:

"There is one point in connection with the forests in this section which we would like to bring to your attention. That is the agents of certain firms in the United States come down on the Halifax and Southwestern Railway on the shore and take off every year from 30,000 to 50,000 Christmas trees. These trees range from three feet to 15 feet. This has been going on now for the past three or four years and if it continues, all the young trees will in time be cut down. There is no way in which the forests can be conserved better than by the stopping of this practice. We would have no objection to cutting Christmas trees for local purposes but when it comes to export then it is time the Association took this matter up and used its prestige in prohibiting it in the future."

Different opinions are held by members of the Canadian Forestry Association in regard to cutting Christmas trees, some holding that if it is properly done in the way of thinning it is not an injurious practice. It was brought up at the Ottawa convention in 1912 and a very general resolution passed. We should be glad to hear the views of members on the extent and probable damage of this export of Christmas trees.—Ed. C. F. J.

THE WOODS OF WESTERMAIN.

Enter these enchanted woods,
You who dare.
Nothing harms beneath the leaves
More than waves a swimmer cleaves.
Toss your heart up with the lark,
Foot at peace with mouse and worm,
Fair you fare.
Only at a dread of dark
Quaver, and they quit their form:
Thousand eyeballs under hoods
Have you by the hair.
Enter these enchanted woods,
You who dare.

—*George Meredith.*

$500 FOR SIXTEEN WILLOW TREES.

The *Toronto Globe* of Feb. 23 had the following about certain trees on Toronto Island, a part of the city much used for summer residences:

"Mr. Justice Middleton yesterday awarded Mrs. Grace N. Moore $500 for sixteen willow trees that had been removed from her lot at Centre Island. Figured out on a hard-hearted, coldly calculating basis, taking a tree as only so much wood without character, a nurseryman estimated the trees as worth 25 cents for each inch of their diameter. Pressed, he consented to the addition of another 25 cents for ornamental reasons.

"It seems that men employed by James Hutchinson, Island Park Superintendent,

who was the defendant in the case, cut sixteen trees from the lot owned by Mrs. Moore. Hutchinson said it was a mistake, and as soon as possible got his men off the premises. The trees, it was contended, formed a screen, threw a little shade, and added lavishly to the appearance of the summer home. The men had imagined that they were cutting trees from city land, and figured they were working for the general improvement of the island.

"In defence Mr. Hutchinson submitted through some witnesses that the loss would be but a temporary one, as the sprouts would shoot up from the stumps and make another hedge or screen in a short time. The willow was a 'terror to grow', and witnesses threw out opinions as to how many inches the trees would grow a year, and how much thicker the trunks would become, and, in fact, went into considerable expert testimony. It was also contended that as the summer home was used but five months the value of the trees was less than it would be elsewhere."

FOREST INSECTS IN BRITISH COLUMBIA.

The ravages of forest insects in British Columbia are exhaustively treated in a bulletin prepared by Mr. J. M. Swaine, entomologist for forest insects of the Department of Agriculture. Timber owners are advised how to recognize the commoner beetles that infest trees and check them by reasonably simple methods.

An investigation was made into insect attacks on the bull or western yellow pine area around Princeton, B.C. In most cases the tree was killed in one year but some trees survived two or three seasons. From 1,500 to 2,000 pairs of bark beetles would be found in the lower 50 feet of tree trunks. The western pine, mountain pine and red turpentine bark beetles, as well as some secondary enemies, were encountered.

To control such a situation, Mr. Swaine recommends that a forest entomologist's advice be first obtained in order to determine the exact species of assailant. Beginning in the autumn, affected trees should be marked for cutting that season. When not possible to float these logs away or saw them in the forest, the next best thing is to fell and bark the condemned trees and burn the bark. As the beetles prefer decaying bark some interesting advice is given on leaving enough slash for them.

The bulletin describes injuries to white pine, lodgepole pine, Douglas fir and Sitka spruce, the methods of protection being about the same as for yellow pine. Excellent pictures accompany the text.

Those interested may receive copies of this bulletin free by writing to Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, Ont.

RAILWAY FIRE PROTECTION.

Mr. Clyde Leavitt, Chief Fire Inspector of the Board of Railway Commissioners for Canada, writes:

"Much progress was made in 1914 in reducing the fire hazard along railway lines through the disposal of inflammable débris on rights of way, in accordance with the provisions of the Railway Act. In eastern Canada, a large amount of this work has been done by the various railway companies, led by the Canadian Pacific and Grand Trunk Railways. An excellent example of a good beginning along the Grand Trunk may be seen in the vicinity of Algonquin Park station, where large quantities of old logs, branches, brush and weeds have been piled and burned, thus very materially reducing the fire hazard in that section of the park. In this case, the work of clearing extends to the land adjacent to the right of way, thus greatly increasing the effectiveness of the protection afforded. In consideration of the joint interest in this work and the fact that it covers a portion of the park area, as well as the railway right of way, the work is being handled on a co-operative basis, between the Grand Trunk Railway Company and the Department of Lands, Forests and Mines of Ontario."

CARE FOR THE BIRDS.

Dr. C. Gordon Hewitt, Dominion Entomologist, urges farmers to encourage birds by building nesting boxes and leaving birds undisturbed on woodlots. Bushes and thickets should be permitted to grow for their shelter. He says very few of our birds are really harmful and most of them destroy enormous quantities of insects. Dr. Hewitt asserts that too much stress cannot be laid on the urgency of protecting native birds. Farmers should never permit shooting of wild birds.

THE OAK.

Downward is sent out a thread-like root,
Up in the air springs a tiny shoot;
Day after day, and year after year,
Little by little the leaves appear,
And the slender branches spread far and wide
Till the mighty oak is the forest's pride.

In fact there's nothing that keeps its youth
So far as I know, but a tree and truth.
—*O. W. Holmes.*

With the Forest Engineers.

Dominion Forestry Branch.

Personnel.

Forest Assistant W. J. Boyd, who returned in November from his canoe trip to Dawson, is at present busy assisting in the organization of the fire ranging for the coming season and in finishing a report of his trip before leaving for Alberta, where he will be attached to the office of the District Inspector of Forest Reserves at Calgary to assist in the administration of the fire-ranging of that province.

Forest Assistant J. A. Doucet will again conduct a reconnaissance survey to be operated in the Peace River District this season and is at present occupying his time organizing this survey.

Mr. James Lawler resigned his position as secretary of the Canadian Forestry Association and has been attached to the head office staff of the Forestry Branch as Editor of Publications.

Several additions have been made to the staff of the Forest Products Laboratories of Canada. Mr. J. L. McNicol has been appointed to the position of paper maker in the pulp and paper division, and Mr. J. G. McNicol has been appointed as helper. In connection with the investigation work to be carried on this summer by co-operation with Queen's University, Mr. J. A. McRae, at present lecturer there, has been appointed as investigator of waste sulphite liquors.

Forest Assistant L. C. Tilt is finishing his work in connection with a report of the timber berth surveys which were conducted last summer, in order to assume his new duties in connection with the Manitoba Inspection office at Winnipeg.

Mr. C. F. McFayden, who resigned his position in connection with the Forestry Branch at Victoria, B.C., has been appointed forest assistant in connection with the Dominion Forestry Branch and will likely be placed on the Athabaska Division of the Rocky Mountains Forest Reserve.

Forest Assistant A. B. Connell has been assigned to the Porcupine and Pasquia Forest Reserves, with headquarters at Hudson Bay Junction, Sask.

Enlisted for the War.

Nineteen employees in all of the Dominion Forestry Branch have already enlisted for active service abroad:

Forest Assistant G. E. Bothwell (present address, "B" Company, 51st Battalion, C.E.F., Edmonton, Alta.)

Forest Ranger E. W. Conant, of the Nicola Forest Reserve, British Columbia, at present with the first contingent.

Student Assistant W. A. Delahey, attached to Regiment No. 971, Platoon No. 1, "A" Company, 49th Battalion, C.E.F., Edmonton.

Mr. F. W. Fraser, of the Forest Products Laboratories, at present with the first contingent.

Ranger G. G. Fuller, of the Bow River Forest Reserve, with the third contingent, Edmonton.

Fire Ranger J. S. Leitch, of the Pas Fire Ranging District, with the first contingent.

Forest Ranger P. G. Leman, of the Bow River Forest Reserve, "B" Squadron, 12th C.M.R., Calgary.

Forest Ranger W. Lyndon, of the Crowsnest Forest Reserve, 13th Squadron, C.M.R., Pincher Creek, Alberta.

Chief Fire Ranger W. J. Maclaren, of the Manitoba South Fire Ranging District, at present with the first contingent.

Chief Fire Ranger Captain R. H. Palmer, with the 49th Battalion, C.E.F., Edmonton.

Forest Assistant A. E. Parlow, of the British Columbia Reserves, with the first contingent.

Mr. H. C. B. Smith, clerk in the British Columbia Inspection office, with the first contingent.

Forest Supervisor H. I. Stevenson, of the Riding Mountain Forest Reserve, at present in command of the cavalry regiment now in training at Brandon, Manitoba.

Mr. H. Wey, clerk in connection with the British Columbia Inspection office (present address, No. 4 Company, 30th Battalion, C.E.F., Willows Camp, Victoria, B.C.)

Mr. A. E. Wyatt, clerk in connection with the Indian Head Nursery Station office (present address, "C" Company, 28th Battalion, Amphitheatre, Winnipeg.)

Fire Ranger D. Smith, of the Manitoba North Fire Ranging District, with the first contingent.

Fire Ranger J. A. Ringer, of the Revelstoke Fire Ranging District, with the first contingent.

Mr. D. N. Trapnell, of the Forest Products Laboratories of Canada, with the first contingent.

Mr. L. N. Seaman, of the Forest Products Laboratories of Canada, with the second contingent.

Talks on Forestry Subjects.

Mr. J. R. Dickson and Mr. C. J. Tulley of the Forestry Branch head office con-

dicted an evening on Forestry before the Botanical Branch of the Ottawa Field Naturalist Club, at the home of Mr. R. B. Whyte. Mr. Dickson presented, by a very carefully and thoroughly prepared paper, an interesting and instructive discourse on forest conditions. Mr. Tulley followed with a discussion of the Dominion Forestry administration, after which he presented an interesting set of lantern slides, illustrating some of the main forest conditions in Canada, forest protection, and some of the practical operations of the Forestry Branch in connection therewith.

Dr. J. S. Bates, Superintendent of the Dominion Forest Products Laboratories at Montreal, addressed the Botanical Branch of the Field Naturalists Club of Ottawa on the evening of March 13 on the subject of "Wood Fibre and its Uses in Pulp and Paper Making". The meeting was held at the residence of Mr. George H. Clark, Dominion Seed Commissioner, and was attended by a number of the members of the Ottawa Foresters' Club. Mr. Bartram of the E. B. Eddy Company and Mr. W. Rice of the J. R. Booth paper mills also attended the meeting. Dr. Bates discussed thoroughly the different processes of pulp and paper manufacture and illustrated his lecture with lantern slides.

In British Columbia.

(*Notes supplied by B. C. Forest Branch.*)

Mr. C. MacFayden, formerly District Forester at Tete Jaune, is now heading a private exploration party in the Peace River country. He recently visited Victoria and in talking about the country said that the journey from Fort George over the Giscombe Portage and down the Crooked, Pack, Parsnip and Peace Rivers is one of the finest canoe trips imaginable. He and his partner used an 18 ft. Chestnut canoe and were delighted with it.

Mr. P. S. Bonney, formerly Forest Assistant at Fort George, is now Acting District Forester at Tete Jaune.

Mr. H. B. Murray, formerly Forest Assistant at Cranbrook and Acting District Forester at Tete Jaune, is now Acting District Forester at Kamloops.

Mr. P. Z. Caverhill, recently District Forester at Kamloops, is now Deputy District Forester at Vancouver. This change is in the nature of a promotion for Mr. Caverhill, the forest management work in the Vancouver District amounting to about two-thirds of that in the entire province.

Mr. J. B. Mitchell, who was Deputy District Forester at Vancouver, has enlisted for active service in the Army Service Corps, Vancouver, which is expected to leave for England in the near future.

Mr. F. McVickar, Forest Assistant, went with the first contingent, and is now probably in France. His address is, "A" Squadron, Royal Canadian Dragoons, care War Office, London.

Mr. A. K. Shives, Forest Assistant, Fort George, is now on a visit in the East. Congratulations are being extended to him by his friends because of the rumour that he is buying two tickets for the return journey.

Mr. G. Melrose is now assigned as Forest Assistant to the Vernon District.

The Forest Branch has so far lost, only temporarily it is hoped, upwards of a dozen members of its permanent force through enlistment for active service. Some of them are already at the front, others are on their way, and the remainder will be leaving with their battalions in the near future. Their names are as follows:—J. B. Mitchell, Deputy Dist. Forester; F. McVickar, Forest Assistant; Wm. Black, M. M. Gibson, M. V. Allen, F. Edwards, J. Turnbull and T. Brewer, rangers; J. Milroy, check scaler; J. Ketteringham, clerk; J. R. Stone, draughtsman; J. Eddie, messenger. In addition to the above men a fairly large but unknown number of forest guards and patrolmen have enlisted for active service.

A reconnaissance of the Pine River and Upper Parsnip River last summer resulted in the discovery of 13 billion F.B.M. of valuable spruce and balsam fir timber. This timber is all directly tributary to the extension of the Pacific Great Eastern Railway which is to be built through Pine Pass. It will form a very valuable future timber supply for the prairie market.

New Technical Organization.

The Pulp and Paper Association of Canada has formed a Technical Section. This new section met and organized on March 5 at the Dominion Forest Products Laboratories at Montreal. The Laboratories will for the present abstract current technical literature and make it available for the members. The secretary of the new section is Mr. Roy L. Campbell, secretary of the Pulp and Paper Association of Canada.

Ottawa Foresters' Club.

Ottawa foresters have been active lately. There has been a meeting of the Foresters' Club and at two meetings of the botanical section of the Field Naturalists' Club forestry subjects have been up for discussion. The meeting of the Ottawa Foresters' Club was held on February 26 at the University Club. The President of the club, Mr. R. H. Campbell, was in the chair and the Vice-President, Mr. Clyde Leavitt was also present. The other members of the club present were: Messrs. Boyd, Byshe, Dexter, Dixon, Doucet, Dwight, Lawler, Macdon-

ald, Robertson, Smith, Thomas, Tulley and Wallin. The occasion of the gathering was an address from Mr. Campbell on his observations in Europe during the past summer. This address was much appreciated and was followed by an interesting discussion. A more extended reference to this address is omitted here because in another part of this issue there appears an article by Mr. Campbell on the subject. The evening was a most pleasant and profitable one.

BRITISH COLUMBIA FOREST MATTERS.

Supplied by the B. C. Forest Branch.

Timber Sales.—During the past year roughly 48,000,000 feet of saw timber was sold by the Forest Branch at an average stumpage price of $1.15 per thousand, over and above royalty of 50 cents. For the most part these sales were small fractions which would be logged inside of one or two years and a large proportion of them were in the Coast district, where Douglas fir, cedar and western hemlock predominate. A total of 67,000 acres was closely cruised for timber sale purposes during the year, on which there was an estimated stand of 560,000,000 feet.

Land Examination.—Land classification is carried on by the Forest Branch for the following three-fold object: (1) To prevent alienation of land valuable chiefly for timber. (2) To make available for settlement all areas suitable for agriculture. (3) To hold under reserve lands which are unfitted for agriculture. The area which has been so classified during the past year is close to half a million acres, of which 170,000 acres have been reserved, carrying a stand of timber of approximately one billion feet.

Scaling.—On the first of January the British Columbia log scale came into use over the entire province, in accordance with the provisions of the Royalty Act. This rule has been in use for a number of years on the Coast, but the Doyle rule has been, until now, the accepted rule for that portion of the province east of the Cascade mountains. This change will make a uniform scale available for the whole province, and will appreciably increase the log scale for the interior.

A GOOD SUGGESTION.

W. C. Read, of Indiana, advocates the planting of nut-bearing trees, including black walnut, butternut, beech, chestnut and pecan. The *Canadian Forestry Journal* mentions walnuts as suitable to Ontario. They will give shade, beauty, fruit, and eventually timber. Why not plant them in preference to trees of less utility?—*Toronto Star.*

NOT PROHIBITION BUT CONSERVATION.

First we had an age of indiscriminate and ruthless tree-cutting. Then followed the age of dissatisfaction and revolt and the demand that not a single tree should be cut where the public could prevent it, and the generation that grew up under the influence of this teaching and practice has come to believe that scientific forestry consists in the prohibition of cutting trees! It would be just as wise to prohibit the cutting of wheat or of oats. Nature gives us our forest harvests; Nature, with the co-operation of man, gives us our cereal harvests. Both are intended to be good for human use, and both can be improved by cutting. The thing for us to do, not in the distant future but in the immediate future, just as soon as we can get to it, is to cut all trees which shall be prescribed by public authority—trees of such a size or of such an age, matured trees—and then either set out others in their place or give Nature herself a chance to reproduce others in their place, so that we shall have a continuous, everlasting forest, man taking from it, from year to year, under restrictions established by public authority, such trees as may be needed for his purposes, and man and Nature filling the gap thus created. —*Dr. J. G. Schurman, President of Cornell University.*

GAME IN NEW BRUNSWICK FORESTS.

New Brunswick, during the game season which closed November 30, well sustained its reputation as a paradise for big game hunters. During the season, the total number of moose, deer and caribou killed and accounted for was 4,738. Probably the largest moose head taken out was one of 64¼ inches, which was secured by Otto Warman of St. John. Three other splendid heads were brought out, measuring 63 inches, 60 inches, and 59¾ inches respectively. Two of these were secured by New York sportsmen. Eight bears are reported as having been killed. There is no return of other fur-bearing animals, or of wild fowl, or of game fish, such as trout and land-locked salmon, for which the province of New Brunswick is famous.—*Busy East Magazine, Moncton.*

A PRAYER THAT NEVER GETS OLD.

Oh for a lodge in some vast wilderness,
Some boundless contiguity of shade,
Where rumor of oppression and deceit,
Of unsuccessful or successful war
Might never reach me more. My ear is pained,
My soul is sick with every day's report
Of wrong and outrage with which earth is filled.

—*William Cowper.*

PINE TREES.

Jennie C. Gay in Harper's.

The wind is low and the world is still,
And sighing trees invite;
And oh, how brown the needles lie!
And oh, the sand is white!
And the steady pines reach up and up
To stillness and to light.

To stillness and the sun by day,
The sun so far and far;
But when the night across the west
Lets down its sombre bar
The steady pines reach up and up
To stillness and a star.

Ah, should you wish to seek the light,
Whatever it may be,
Come dwell where slender stems upreach,
Aspiring constantly;
Come dwell where silence lends the search
A fine intensity.

The Forestry Service of British Columbia points out that their experience has proven conclusively that forests act as a bar to avalanches. Numbers of cases have come to their notice of this newest argument for conservation of forests.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots clearing [illegible] three acres a day, doing the work of [illegible] men. We SAVE you the cost of [illegible] and [illegible] send for our 3 year guarantee against breakage and our [illegible] Address
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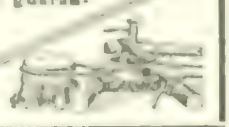

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The Membership Fee is one dollar per year. Members receive free of any additional charge the Annual Report and *Canadian Forestry Journal.*

Application for membership may be made as below:—

Canadian Forestry Association,
Journal Building, Ottawa, Canada.

Gentlemen:—I desire to become a member of the Canadian Forestry Association and herewith enclose One Dollar membership fee.

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EDITORIAL.

In the speech from the Throne at the opening of the Legislature of the Province of New Brunswick, on March 11, announcement was made that a new act to provide for a complete and scientific survey of the seven million acres of Crown Lands in New Brunswick at a cost of $400,000, would be introduced. It was announced that the survey would probably take three or four years to complete, and would lead to a re-classification of Crown Lands.

The committee appointed by timber limit holders in the Upper Ottawa valley to consider the question of forming a forest fire protective association like those in the Lower Ottawa and St. Maurice valleys have decided that there is not now time to organize for the danger season of 1915. No further action will therefore be taken at present. It is understood the St.

Maurice and Lower Ottawa Associations are fully prepared for the opening of the danger season.

In the March issue of the *Canadian Forestry Journal,* owing to an oversight, it was not stated that the article by Mr. R. H. Campbell, Dominion Director of Forestry, on "The Relation of Forestry to the Development of the Country" first appeared in the *Western Lumberman,* Winnipeg, which journal also kindly loaned the cuts with which the article was illustrated.

THE NEW SECRETARY.

At the Annual Meeting of the Canadian Forestry Association on Jan. 19 a special committee was appointed to deal with the matter of securing a new secretary to take the place of Mr. Lawler who, after nearly six years' service, resigned at that meeting. The committee, which was composed of Mr. Denis Murphy, chairman; Mr. R. H. Campbell, Mr. Gordon C. Edwards, Mr. A. S. Goodeve and Mr. Clyde Leavitt, went carefully to work and as a result, with the sanction of the Board of Directors, Mr. Robson Black of Toronto was selected and begins his new duties on April 15. This will therefore be the last number of the *Canadian Forestry Journal* issued before Mr. Black takes over the work.

Mr. Black has been engaged in newspaper and magazine work and in various forms of publicity and organizing. He is in touch with a large number of the public men of Canada and comes to the Association with a successful record and with strong recommendations. While it will probably not be possible to hold a convention for some time Mr. Black will have plenty to do in other fields of work and we bespeak for him the same steady support which was accorded by members to his predecessor.

WAR TAX ON LETTERS.

A war tax of one cent has been imposed on each letter and postcard mailed in Canada for delivery in Canada, the United States or Mexico, and on each letter mailed in Canada for delivery in the United Kingdom and British Possessions generally, and wherever the two cent rate applies. This became effective on April 15, 1915.

This war tax is to be prepaid by the senders by means of a war stamp for sale by postmasters and other postage stamp vendors.

Wherever possible, stamps on which the words "War Tax" have been printed should be used for prepayment of the war tax, but should ordinary postage stamps be used for this purpose, they will be accepted.

This war stamp or additional stamp for war purposes should be affixed to the upper right hand portion of the address side of the envelope or postcard, close to the regular postage so that it may be readily cancelled at the same time as the postage.

In the event of failure on the part of the sender through oversight or negligence to prepay the war tax on each letter or postcard above specified, such a letter or postcard will be sent immediately to the nearest Branch Dead Letter Office.

REFORESTATION IN SIMCOE COUNTY

Wm. J. Holden, Collingwood, has just finished planting an extensive plot of trees to demonstrate the possibility of reforestation in Simcoe Counyt. The area planted includes six acres of land along the bank of the Pretty river, and required 16,000 trees. The trees were supplied by the Provincial Forestry Department, in charge of Prof. E. J. Zavitz, and planting operations were directed by J. Laughland, District Representative of the Department of Agriculture for Simcoe County. The varieties planted included: Scotch pine, white pine, cedar, black walnut, butternut, chestnut, black locust, white ash, white maple, and elm. The trees were carefully planted, four feet apart each way.

In every part of the province there is much waste land of little value along streams and rough hillsides or sandy plains, and which will remain in the future as it has in the past in this worthless state unless trees are planted on it. Anyone with an acre or two of waste land on their farm cannot do better than plant trees on it.—*Farmers' Advocate.*

Reconnaissance Forest Surveys

Object of Such Surveys and How Much Has Been Done in Canada Explained by Mr. H. Claughton Wallin—Canada Should Become the Greatest Timber-exporting Country in the World.

A departure in regard to technical matters was made in the head office of the Dominion Forestry Branch at Ottawa, when, on March 26, Mr. H. Claughton Wallin, Chief of Surveys, read a paper on "Reconnaissance" before the technical staff of the branch.

Mr. R. H. Campbell, Director of Forestry, explained at the opening that the object of these papers and discussions was to keep the officers of the different parts of the work in touch with one another, so that all would be informed of the work and aims of other sections than those in which they worked, that all the work might be related and move forward with the greatest degree of efficiency.

Objects of Reconnaissance Surveys.

Mr. Wallin's paper will doubtless appear in technical journals but some of the salient points, which enforce the lessons of forest conservation, are deemed too pertinent not to be printed in the *Canadian Forestry Journal*.

Mr. Wallin pointed out in the first place that the objects of reconnaissance surveys are to procure information as to the value of the lands examined in relation to agriculture and as sources of water or timber supply, and to determine the advisability of recommending them for inclusion in forest reserves.

Dangers of Ill-directed Settlement.

Mr. Wallin showed that now the prairie lands were becoming settled, settlers were pushing out into the wooded country. The first settlement generally occupied fertile lands but as the river bottoms and lands surrounding lakes were taken up the settlers stuck out into the country surrounding, and in many cases located on lands, which because of their rocky, hilly, or sandy nature were not capable of supporting their owners decently. Many new settlers were not farmers but city men who did not understand soil values. Hence there was the greater reason for the examination of lands in advance of settlement to prevent these uninformed people locating on land which they would either abandon in a few years to return to city life, or continue to eke out an existence by working for several months each year for their neighbors in the fertile districts. Thus the man would not be of his full value to the country, and the 160 acres of land he had homesteaded instead of increasing in value would be deteriorating because the young timber which it could grow if left alone would be taken off in useless clearing or burned by fires started accidentally or intentionally.

To Increase Agricultural Prosperity.

Thus one object of the reconnaissance survey was to increase the prosperity of agriculture in Canada by withdrawing unsuitable lands from settlement and another was to protect the timber supply and, in direct consequence of this, to maintain a stable flow in the watercourses, by placing absolute forest lands and stands of timber in forest reserves where they would be protected from fire and trespass.

Policy of the Dominion Government.

The policy of the Dominion Government was that lands which were unsuited to agriculture but were important watersheds, or valuable to the adjacent community or the country as a whole on account of their timber resources, should be included in forest reserves for the purpose of ensuring regulation of stream flow and a perpetual supply of timber.

There were two kinds of forest reserves in the West, those in well-populated districts and those in rough mountainous districts, or the unsettled and unsurveyed regions north of the prairies. The reserves in populated districts consisted of sandy, more or less timbered, hilly country, surrounded by settled agricultural land. Such districts were comparatively few and it was important that land of this character be devoted to the growing of timber to relieve the need for firewood, fence posts, and small building timber which was always felt in the treeless prairies.

Dispel Wrong Ideas.

Mr. Wallin pointed to the duty of the officer in charge of the survey to acquaint himself with the views held by settlers in the vicinity of the proposed reservation. He should explain that the creation of the reserve meant the protection of timber, grazing and water supply for the farmer himself. The erroneous idea that the object of a forest reserve was to prevent the "poor man" getting his supply of fuel and timber should be dispelled.

One Hundred Thousand Miles Surveyed.

The lecturer then went on to explain in detail the instructions given the officers in charge for prosecuting their work. After dealing with this he said that since 1909 the Dominion Forestry Branch had placed in the field 34 reconnaissance par-

ties and these had covered an area of a little more than 100,000 square miles in Manitoba, Saskatchewan, Alberta and the Railway Belt in British Columbia. This area was largely distributed in a belt north of the prairies. Another year would give, he hoped, a solid belt of examined land from the western boundary of Ontario to the Rocky Mountains. The cost of these surveys averaged about 60 or 65 cents per square mile.

The Loss From Fires.

The information so far compiled showed that at least 80 per cent of the area examined between Lake Winnipeg and the Rocky Mountains had been burned over during the last 50 to 75 years.

The white spruce, the tree best adapted to these regions, was comparatively scarce because of having, after these fires, been replaced, at least temporarily, by aspen. At the present time aspen which in northern Europe was considered one of the worst enemies of foresters and lumbermen, was the leading tree. It was hoped, however, that efficient fire protection would help spruce to get into its own again. On sandy soils the jackpine in the east and lodgepole pine in the west were the species par excellence.

Canada's Great Opportunity.

From a careful study of all the data available Mr. Wallin was of opinion that, with the exception of muskegs and high altitudes in the Rockies, the non-agricultural land in the country examined, if properly protected, was nearly all capable of producing excellent spruce and jackpine timber under a comparatively short rotation. Foresters should do all they could to see that logged-over and burned areas were restocked with spruce or jackpine. If they could succeed in this there was no reason why Canada should not have timber for export as well as for her own use for all time to come. This conclusion was partly the result of comparisons between Canada and Mr. Wallin's native country, Sweden. In Sweden there had been periods of great fires and wasteful logging and yet that country with an area of about 52,000,000 acres in forests was in a position to-day, after half a century of rational forestry methods, to export millions of dollars' worth of lumber and other forest products. During the forty years 1871 to 1910 Sweden exported $1,480,000,000 worth of round timber, sawmill products, pulp and pit props. The total value of forest products in Sweden to-day was estimated at $100,000,000 per year, and yet the forests of that country were not over-exploited. In addition to this timber grew quicker in Canada than in northern Sweden, where most of the forests were found.

What Sweden Has Done.

Mr. Wallin's conclusion on this point was: "It seems to me that if a country (Sweden) which is only about the size of Manitoba, can make so much out of her forests without exhausting herself there is no reason why Canada with her immense areas of forest land should not become the greatest timber-producing and timber-exporting country in the world; but to reach this goal proper protection and proper management of our forests is necessary and this I think can only be obtained by including absolute forest land in forest reserves."

DR. SCHENCK IN THE WAR.

Dr. Schenck, founder and head of the Biltmore Forest School, who about a year ago gave up his work in America and retired to live in Germany, has been fighting in the war on the side of Germany. Dr. Schenck is known to many in Canada and the following item clipped from the *Biltmorean*, the organ of the graduates of Biltmore School, will interest them:

"Just after the *Biltmorean* went to press a most interesting letter was received from Doctor Schenck. On December 15th, at the battle of Lodz in Poland, the Doctor was shot through the abdomen but by prompt attention on the part of the surgeons at the military hospital in Lodz his life was saved and he was able to be taken back to Darmstadt on the 27th of December, arriving home on the 29th. By January 11th, he was able to walk over to the 'Exerzierplatz' and expected within two weeks from then to be able to rejoin his regiment in Poland. Doctor Schenck, who has received the Iron Cross for bravery, is an 'Oberleutnant and Adjutant' (Lieutenant-Colonel and Adjutant) in a battalion of Lendwehr Infantry and was in the thick of the fighting from November 16th until the time he was shot."

NOTES.

Officers of the Okanagan national forest, in the State of Washington are installing powerful signal lanterns for night use in reporting forest fires from lookout peaks.

A report upon the timber and soil conditions ni southeastern Manitoba, has been issued as Bulletin No. 45, by the Forestry Branch of the Department of the Interior.

Of the total area of Ireland, about 1.5 per cent is under woods, while the woods in England are 5.3 per cent, in Scotland 4.5 per cent, and in Wales 3.9 per cent of the total areas.

Successful Tree Planting in Ontario

Mr. N. Silverthorn of Summerville Tells How He Does It.

In the January issue of the Canadian Forestry Journal there was a description of a fine grove of trees planted between twenty-five and thirty years ago by Mr. Silverthorn, at Summerville, Ont., on his thousand acre farm. Messrs. Fraser & Co., the well known lumbermen of Ottawa, wrote Mr. Silverthorn asking what methods he used in planting and the *Journal* is privileged to publish his reply. Mr. Silverthorn writes:

"In the first place I might say that the face of the hill is quite steep, and at the time of planting was covered with native grass. The soil is a clay and sandy loam. The hill faces the north and turns southerly, making a north and west wind-break. The planting was in the last of May and June, and was not much of a job, as I could get thousands of seedlings close at hand, and so thick that fifty could be got in a handful. None of the plants was longer than from five to six inches. I would get 1,000 of them in a basket on one arm, and a dibble in the other. I would jab in the dibble three or four inches and putting the plant in, finish the same with two or three strokes. The plants never received any attention afterwards and 95 per cent of them grew, although I handled them so quickly that I would plant 2,000 of them in a part of a day. The seedlings were mostly cedar, but some white pine, and a very few white birch (or lady of the forest). On the upper or outer edge were put in here and there lilacs, siringa, or mock orange, juneberry, and hemlock. There were a few tamaracks put in here and there on the hill and they have done well, but some years are preyed upon almost to death by the larch saw fly.

"As to my experience in raising evergreen trees from seed, I have had none, but I have had successful experience with walnut, butternut and hickory. I have not had success, however, with chestnuts, which it seems our climate does not suit. Walnut and hickory trees will grow under almost any condition of soil, but butternut trees will only thrive on light damp ground.

"My method of planting the three successful trees noted above was as follows: After the nuts have fallen from the tree, let them lie on the ground say for a month. Then mix the nuts with the hulls on, in, say, one-third loamy, damp soil, one-third well-rotted manure, and the other one-third of nuts. Mix well together and put in a nail keg, head up, and bury in the ground eight or ten inches deep and leave until April or May, until they have burst and show a root of two or three inches. Then plant where they are to grow, or in a clean bed for one or two years, and then plant.

"I might say that some twenty-five years ago on one of my farms there was three-quarters of an acre near the house, of broken land with a small creek at one side, that I planted with potatoes. In every third row I had dropped with the potatoes, walnuts, butternuts, hickory nuts and Niagara chestnuts, but each kind by itself. The nuts were dropped about four feet apart, in the row, the seed having been sprouted as related above. The nuts were covered and cultivated with the potatoes, and to-day with the exception of the chestnuts they are a pleasure to look at."

WASHINGTON FOREST FIRE ASSOCIATION.

That the Washington Forest Fire Association is keeping successfully at work is evidenced by the seventh annual report of the organization covering operations for 1914. The president, Mr. Geo. S. Long, of Tacoma, Wash., points out that during the year only 30 million feet of timber was fire killed, this representing only two-tenths of one per cent of the standing timber in Washington state. Such an exceedingly light loss is attributed to the excellent co-operation between the Association's patrolmen and the forces of the State Forester and the United States Forest Service. July, August and September were very dangerous on account of the excessively dry weather. A successful experiment was carried out in getting notice from the Weather Bureau of approaching easterly winds which during the previous 12 years had been co-incident with most of the disastrous fires. One of the fires occurring last year had the peculiar origin of being caused by the friction in pulling one log over another.

The Association carried on its work with an assessment on its members of 2 cents an acre. Over two and a half million acres of timber land are listed with the Association. Scattered in among this area is fully one million acres owned by non-members. The Association deplores that these owners do not participate in the fire protection work as their limits have to be guarded also for the proper defence of the rest. The report recommends that Washington follow the example of Oregon in compelling all timber owners to co-operate in patrol of lands during dangerous seasons.

Telephone Lines in Logging Operations

The Value of the Installation in Fire Protection and Facilitating Work.

The value of the telephone in logging operations and fire ranging is explained by Mr. Charles E. Read, Jr., of the Riordon Pulp and Pajer Co., in a rceent article in *The Pulp and Paper Magazine.* He relates that company's experience from the building of its first line. This line, intended for fire service only, ran up Trembling Mountain from the company's St. Jovite office to a lookout station, 2,000 feet above the surrounding country. The system was a single wire or "ground return". It connected with the Bell Telephone Co. through a repeating coil. No. 9 wire, weighing 305 pounds to the mile, supported by No. 18 7-strand soft seizing wire, with split ring insulator, was employed. To prevent a longitudinal slip, an oak bracket and glass insulator were used several times in each mile. On account of the rocky, treeless region traversed, it was necessary, in many places, to put in rock bolts to hold the poles. Such a one-wire system, says Mr. Read, can be built for $55 a mile.

This line revealed the possibilities of a telephone service in assisting bush operations as well as fire ranging. The second line was erected so as to serve, also, in the conduct of shanties and drives. It was a two-wire or metalic system, costing about $90 a mile where the line could be hung from trees. This line connected with the Bell system. The wire was No. 12, galvanized iron, weighing 165 pounds to the mile. Oak side brackets and glass insulators, 30 or 40 per mile, were used for support. The cost would be increased where it is necessary to erect poles instead of hanging the wire on trees.

These lines proved so useful in fire defence and wood operations that a more extensive telephone service was designed.

The first part of the new programme consisted of a line up the main Rouge river, with spurs reaching all the company camps. The system followed the portage road as much as possible to facilitate repairs in case of a breakdown. When water was low last spring, Mr. Read says, these telephones were of splendid service. Formerly, it would take from 8 to 16 hours for a man to go from the head of the drive to the storage dams with orders for opening and closing. All this valuable time is saved now by a simple telephone message. As the gangs come down the river they bring the telephones along and are able to use the line wherever they camp. A telephone set with materials for installation costs about $15 or $16.

Extensions were made up the two chief branch rivers. Connection with the Bell Company made every lumber camp a long distance station.

Mr. Read dwells on the advantages of having direct conversations between the manager and his foremen in operating camps and drives. The whole cost of the lines, he is confident, has been saved in getting prompt aid to a single fire. He divides the cost approximately thus: Materials, 22 per cent; labor, 45 per cent; provisions, 23 per cent; teaming, 10 per cent.

THE INVOLUNTARY INCENDIARY.

The involuntary incendiary is the man whom all of you know. You see him every day. If you are as fussy as I, you follow him and try where possible to prevent his deadly devastation of life and property. You trample on the half-burned match he throws away; you extinguish his smoking cigar or cigarette stump; you douse his smouldering bonfire and campfire; you cover with metal his open gasoline and coal-oil can; you chink with mortar the cracks in his defective flues; you drench his smoking ash-heap, as its live coals are about to be fanned into flame. And all the while you denounce him as the fire fiend's fool accessory. This involuntary incendiary is the man whose acts are foolishly criminal, as those of the voluntary kind are wickedly criminal.—*The Insurance Commissioner of Utah.*

FOREST FIRES AND SOIL FERTILITY.

Experts state that forest soils have lost and are losing much fertility owing to forest fires which, doing apparently little immediate damage, rob the soil of accumulations of humus. In many sections land is being cleared for farming, and, where such forest land has not been burned, there is a large percentage of vegetable matter which provides considerable fertility and a good mixture. Moreover, as this soil has a greater capacity to absorb and retain moisture, it is less likely to be washed and gullied under heavy rains. For these reasons, in addition to the damage to standing timber, authorities agree that wood lands should be very carefully safeguarded against fire.

POEMS REVISED.

"Woodman, chop that tree;
I'll burn it every bough.
In youth it sheltered me,
But coal is dearer now."

NEGLECT OF CUT-OVER AREAS.

The neglect of cut-over timber areas is deplored by Mr. Clyde Leavitt, Chief Inspector of the Board of Railway Commissioners. He states that forest growth has been utterly destroyed by repeated fires on thousands of square miles of such non-agricultural lands in eastern Canada. Lumbermen show a tendency to abandon these limits since there is no young growth to promise future profits. The revenues of the several provinces will therefore suffer, not only from loss of stumpage dues, but from the cessation of ground rental. The virgin forests are disappearing fast enough to demand more attention being paid to the limits previously cut over. Not only is the young growth destroyed so but also are the seed trees which are needed to reproduce the more valuable species. Soil fertility suffers from loss of humus and erosion goes on till bare rock is exposed. Mr. Leavitt concludes that these wastes might be made permanent sources of raw material for industry.

WHY GEORGE CHOPPED THAT TREE.

'What's the idea, George?' inquired Mr. Washington. 'Why do you chop down this cherry tree? Have you anything against cherry trees?'

'No, sir.'

'May be you are in favor of deforestation?'

'No, sir.'

'Doing this for a moving picture concern?'

'By no means.'

'Then why chop down a tree?'

'I just thought of going on the stump,' replied the future father of his country, and then Mr. Washington realized that George was a born statesman.—Kansas City Journal.

BOYS AND TREES.

Much of the damage done to nut and other trees by the boy is done through ignorance and carelessness. If he were taught more about trees, their seeding and growing habits, the injury caused by making wounds in the bark; if he could set out and raise some trees that he would feel were his own, the trees would become such close friends of his that he would come to be their natural protector.

Again, a few visits with proper instruction to where a house is being built, a fence being put up, a wagon in the course of construction, also a trip to the neighboring sawmill would give him very valuable lessons in the uses of wood.—*O. J. H. in Penn. Forestry Annual.*

THE WOODPECKERS' WORK.

More and more we realize the importance of planting trees and taking care of the forests we have, because they are going so fast. Lumbermen chop them down. Fire burns them up. Insects bore their very life out.

There is one little bird that is doing all it can to destroy the insect-enemies of the trees. It is the downy woodpecker. The State of Washington has honored him by choosing him for the seal of the State. Watch this industrious bird when you chance upon him. He is so tame and intent upon his work that your presence will but little disturb him. He is one of the tireless, all-the-year-round workers, for whom the days are scarcely long enough, especially in winter, to get a good living. Because he is often seen in the orchards, he has been suspected by those who do not know him of being after the fruit. It is never the fruit, however, that he is seeking, but the grubs that injure the fruit.—Selected.

TREE CONUNDRUMS.

What tree its old age sadly cries? Elder.
And from what tall one comes low sighs? Pine.
Which bears the mark of a smoldering fire? Ash.
And which to chastise you takes your sire? Birch.
Which one do you carry about in your hand? Palm.
And which one tall and slim doth stand? Poplar.
Which one bears fruit so golden and round? Orange.
And which one hears the sea's deep sound? Beech.
Come, tell now, which is a stale joke? Chestnut.
And which from a stale acorn woke? Oak.
Which tree is cloth and fuel in one? Cottonwood.
And from which does sweet fluid run? Maple.

FORESTS PREVENT FLOODS.

An insignificant stream is suddenly converted into a raging, destructive giant. Experts in forestry tell us that one of the causes is the destruction of the forests, which act as reservoirs, holding the water back in spring, and distributing it gently and gradually in summer. This subject might be studied more thoroughly, and a greater amount of evidence collected. Conservation of resources ought to include the prevention of such heartrending tragedies as have occurred in Ohio.—*Toronto Star.*

History of the Canadian Timber Trade

Lecture on This Interesting and Important Subject.

"The Romantic History of the Canadian Timber Trade" was the subject of the lecture given on March 25 in the Carnegie Library by Mr. James Lawler, honorary secretary of the Canadian Forestry Association. It was the last of the series given by the library board, and was one of the most interesting. Mr. Sykes, librarian, was in the chair, and the lecture was illustrated by a series of over 80 slides.

Mr. Lawler pointed out that the subject was so large he would be able only to touch upon the most important phases. The timber trade, he said, was the second trade entered upon after the discovery of the country—the fur trade being first. It was second only to agriculture in importance now. Such a large proportion of the soil of Canada was suitable only for trees that the forest industry should remain the second industry forever unless Canadians were criminally neglectful of their forest heritage. In this connection several diagrams were shown indicating the growth of the timber trade, particularly in exports since 1868. It was shown that since Confederation the export of forest products equalled 21 per cent of the total exports. Taking up the historic side of his subject, the lecturer began with the old French governors, showing the old castles and houses of Quebec, and pointing out that the first regulations in regard to timber were made by both the English and French governors and were with the object of reserving the oak for building the hulls of the Royal Navy, and the pine for making the masts. A review was given of the period of the seigniors, in particular the Lotbiniere seigniory about 40 miles above Quebec, which has been in possession of the family since 1655, and upon which advanced forestry methods have been practised for 50 years. He noted that Sir Henri Joly de Lotbiniere was the first president of the Canadian Forestry Association, and one of the fathers of scientific forestry in Canada. A number of pictures showing the development of the trade in the Ottawa valley were shown, culminating with the famous exhibition of lumbering before King George V. when he visited the Capital in 1901. Mr. Lawler also touched upon the dramatic incidents in the trade, including the Miramachi fire, and reviewed the timber and shipbuilding industry in the Maritime Provinces and the lumber industry of British Columbia.

A vote of thanks was moved by Dr. P. H. Bryce, seconded by Mr. A. McConnell.—*Ottawa Citizen.*

STOCK TAKING NEEDED.

There is strong reason for the belief that the forest resources of Canada have been much over-estimated, and the necessity for a general stock-taking is obvious, in order to provide the basis for a comprehensive plan for intelligent conservation.—*Sir Clifford Sifton.*

AS THE BURN WIMPLES.

Wimplin' burnie, whither awa',
Through the wood, and down the fa',
Black wi' shade, and white wi' faem,
Whither awa' sae fast frae hame?

Woodbirds on thy sparklin' brink
Dip their bills, and thankfu' drink,
Mak' the forest arches thrill,
With their warblin' sang and trill.

Where thy stanes are green wi' moss,
Barefit bairnies wade across. . . .
Clover-breathin' humane cows,
Stan' beneath the apple-boughs,
Lash their tails and chew their cud,
Knee-deep in thy coolin' flood.

—*Jeremiah Rankin.*

CHINA NEEDS TREE SEEDS.

Prof. Joseph Bailie of the Department of Agriculture of the University of Nanking, China, has written to Dr. C. C. James, Commissioner for Agriculture, Canada, asking for gifts of tree seeds in connection with his work of getting destitute Chinese on vacant lands. Prof. Bailie states that he has got over one hundred families on the land and that now more than half these are close to being independent. Independence he says is a comparative term and what these poor people reckon independence would not be thought so in Canada, where the population wastes every year what would make double their number in China independent. He appeals for seeds of conifers and of such broad-leaved trees as would grow in Nanking.

The agricultural department in the University is very young and there are a dozen students. They are short of everything except land, of which a good deal has been given by the government and it is on this that the colonization experiment is being tried.

A TREE OF SEVEN YEARS GROWTH.

Farm and Dairy of Peterborough, to which the *Canadian Forestry Journal* is indebted for the above cut says: "One does not need to wait a life time to have beautiful trees around the home. This Carolina poplar is just seven years from the nursery, and has attained a height of fully 50 feet."

CARE OF BIRDS IN CANADA.

A survey of the means, legislative and educative, taken in the several provinces of Canada for the protection of birds, is published by "The Agricultural Gazette of Canada".

The Game Laws of Prince Edward Island protect partridge, woodcock, snipe, wild duck and water fowl and prohibit killing wild fowl between sunset and sunrise. Since 1905 the P. E. I. Fish and Game Association has been teaching the public the utility of birds, especially to the farmer. One of the aims of this association is to encourage forestry. A dozen varieties of birds, similar to those mentioned, are protected under the Game Laws of Nova Scotia.

In the Quebec Game Laws, a score of common birds are named as enjoying protection from being killed, at any time, or [illegible] vember 1st. It is equally forbidden to take their nests or eggs. Eagles, hawks, crows, sparrows and some others are not included in this prohibition.

Ontario has a law making it an offence to kill, catch or injure any wild native bird, except those specially mentioned in the game laws, and one or two other exceptions. Through the government and through private organization much educational work is done to arouse interest in protecting birds.

Birds are protected in Manitoba by an act which includes all varieties except those specially named as not desirable. An association also carries on a campaign to teach the value of birds to the country.

The Useful Birds Act of Saswatchewan gives protection to all insectivorous birds and their nests and eggs. The deputy minister of agriculture estimates that the

daily consumption of noxious insects and weed seeds, by the birds, is 633,000 bushels. Nature study is much encouraged and two societies in the province are interested in bird-life. Alberta also goes far in defence of birds. Only such birds as are specified may be killed or captured and then only at specified times. The aim of the legislation is to preserve song birds, game and insect eaters.

In British Columbia the protection of sea birds is a problem and the establishment of reserves on one or more islands is proposed. With a few exceptions all other wild birds are protected by law. Recently, some imported English song birds were added to the list of those enjoying protection when it was shown they were not harmful to crops. Imported birds have been treated similarly.

OIL BURNING LOCOMOTIVES.

Grand Trunk Pacific Will Use Them to Reduce Fire Risk on B. C. Division.

The Grand Trunk Pacific Railway has announced that contracts have been let and other arrangements made for the installation of crude oil as locomotive fuel on their passenger engines to be operated between Prince Rupert, B.C., and Jasper, Alta., a distance of 718 miles. It is expected that this installation will be complete by next June. The announcement does not cover the use of oil-burners on freight engines; it is understood that these will continue to use coal, at least for the present.—*Conservation.*

FORESTS AND WATER STORAGE.

Storage reservoirs, alone, can never be made to control spring floods. This is the result of half a century's study by foresters and climatologists.

Forests, in various ways, conserve the water which falls in the form of rain or snow. Branches of trees, by breaking the force of rain, let it pass into the soil easily. The cover, formed by decaying leaves, has great water absorbing capacity. The water held is given off slowly during months, thus supplying springs and maintaining an even flow in streams. In addition to these influences the forests delay thawing through the heavy foliage sheltering the snow from the spring sun. When this snow is kept very long in the forest and a long period of warm rain ensues there may be greater floods as a result of the forest influence but such circumstances are rare. While forests thus serve as protectors of soil and conservers of water they are producing valuable wood crops.

General uniformity of stream flow can be brought about by intelligent reforestation, combined with storage dams on the headwaters of the especially dangerous streams. In this way the essential work of the forests is supplemented and the waters impounded for the dryer seasons. Proper control of the runoff will maintain industries dependent on water power and insure proper levels for navigation.

SCHOOL CHILDREN AND FORESTRY.

The Forestry Division of the North Carolina Geological and Economic Survey recommends the collecting of wood samples, leaves, nuts, etc., as a profitable diversion for children. It publishes a bulletin on this subject in connection with a competition the Central Carolina Fair Association has arranged, offering $20 in six prizes for collections of native woods and leaves. In both cases specimens are to be named. Competitors are to be children, under 16 years. The Forestry Division approves the idea, stating that the child's natural desire for collecting may furnish one of the readiest avenues for instruction. To secure the best results parents should direct the efforts and teachers should recommend books on the work. It is suggested that a collection of forest seeds would be an instructive object lesson as so many people do not know what the seeds of the commonest trees look like. The flowers and leaves of native shrubs, wild flowers, ferns, mosses and grasses are mentioned as being well deserving of collection for county fair exhibits.

DOUGLAS FIR.

Douglas fir is the chief timber species in British Columbia, and is third in importance in Canada, deriving its name from David Douglas, who discovered it in 1827 and introduced it into the gardens of Europe. Its adaptability and rapid rate of growth led to its being largely planted as a forest tree in Germany, France, Denmark and England, and the Indians in British Columbia sell immense quantities of seeds to European dealers every year. A Danish plantation at the age of 29 years produced 87 cords of wood, equal to an annual production of three cords per acre, which is about three times the growth-rate of white pine on average soil in Canada. The wood of Douglas fir is also considerably stronger than white pine, and is valued highly for construction purposes because of its size, strength and comparative lightness.

A Woman's Plea for Trees

Miss E. Bowers, Bridgewater, Nova Scotia.

Forest Conservation is not going to be left entirely to the men. In the United States the women have greatly helped and from the beginning women have been members of the Canadian Forestry Association. The following synopsis of an address by Miss E. Bowers before the Women's Institute of Bridgewater, Nova Scotia shows how some women are working:

"Most of my life as a teacher has been passed in country sections, and my home for many years was a farm.

"I chanced to hold schools in sections where there was very beautiful scenery. Varied influences caused me to take up, whole-heartedly, Nature Study, as we term it in our school curriculum. Fast following the nature student period, one finds oneself a nature lover, and to be a nature lover denotes real interest, a fondness for flowers, for bird, for forest habitant, for every babbling brook and placid lake, and for every tree.

"During the latter terms of my service in the country, I lost no opportunity to impress upon my pupils the wisdom of conserving our forests. Outside of school I placed a plea—as chance offered, and at public examinations, I always gave a lesson on trees. But all this was little. One may say, I myself was but awakening to the importance of the subject. Besides I had no technical knowledge of the great principles of forestry—trimming, culling and replanting. Then there was lacking the great spirit of co-operation to produce any results.

"Now, I think this Institute could, and should arouse some enthusiasm in the preservation of our woodlands. And why should our association be interested?

"Because, scarcely a better medium could be found to influence the rising generation of land owners, than the women of the farms, and the rural school teachers. Constantly the press sends out warnings of the dire consequences following a destruction of the forests. It is an oft-repeated lesson to state that forests are a prevention of destructive winds, irregular rainfalls, terrible floods, and so on.

"The value of forests in relation to water supply is not that they cause precipitation, but that they provide natural reservoirs for the storage of water after it has fallen, and that by giving it out gradually, they regulate and equalize the flow of streams.

"Clearing the land about the sources and upper reaches of a river has a disastrous effect upon the river. It is a principle of nature: no forests, no waterways. Floods in China and in treeless districts of Europe and the United States afford striking examples.

"Our neighbors in the United States are keenly feeling the result of the vandalism that swept their country, where the misuse of this great natural product has resulted in all sorts of losses.

"Latest statistics prove, also, that the productive possibilities of much of their farming land has been ruined by the loss of surface springs, following the destruction of forests. This loss of surface springs brings it very close to everyday farming. Scientific farming primarily entails that knowledge which can combat conditions arising from this fatal error, this wantonness of the early settlers.

"Present day farming with its schemes of tillage, subsoiling and irrigation, delays the loss of production on account of the disappearance of this invaluable circulating system. But the great remedy remains—reforestation.

"Frequently an alarm cry goes forth through the pages of some magazine or newspaper that should teach Canadians to check the ruthless onslaught of the axe and the saw.

"But these warnings are received by most much as the little child accepts the terrors of the bug-a-boo: very dreadful—but, perhaps, nothing in it.

"Canadians should conserve their wonderful forests, a source of great wealth. It is said that the comparative value of Canadian forests is three times that of all its mineral wealth, and ten times its gold and silver output alone. The wondrous uses to which wood is applied forces it ever in immense quantities upon the market.

"England alone imports 350,000 tons of ready-prepared pulp for newspapers only. And it takes for one day for newspapers for the city of London about 400 tons of white paper, made from pulp which denotes some hundred cords of wood per day—that in turn denoting an average weekly destruction of very many acres of the forests.

"It is a lamentable fact that, to disseminate the knowledge that the forests are a source of great wealth, seems but to implant a spirit of greed which is the direct influence leading to their destruction.

"But why kill the goose that lays the golden eggs? The farmer must learn the great principles of trimming and culling his trees and also the necessity of reforesting and afforesting. He must look upon the woodlot as first aid to preservation of

soil, in short, as the assurance of his livelihood and that of his heirs.

"The young people of the rural districts should be trained to see the difference between the value of a stripped woodlot and a conserved woodlot. The first has a worth that is but for a time, while the other with judgment can last for generations.

"The government of Sweden owns and cares for 18,000,000 acres of forest land. The proceeds from this state property pay for all workers in it, for the forestry schools, and a large portion of the public school expenses. This latter expenditure is no mean amount when it is considered that Swedish schools are splendidly equipped and education is so extensive that Sweden has the least percentage of illiterate inhabitants of any of the European nations.

"Norway and Germany reap a high profit from their forest holdings, and more than that it is found that these forests are better today than they were at the organization of the system.

"If it is thus a financial success in great areas, why not for the individual farmer?

"In wishing to reach a point upon which I may arouse interest in trees, I will enumerate the general uses of forests: They furnish fuel and lumber; they regulate and promote, to a degree, rainfall; they protect the country from destructive winds; they hold water in the soil, thus preventing floods; they promote health by using poisonous gases and give off life-sustaining oxygen; in the decay of their fallen leaves and branches they furnish humus for the soil; they are the upkeep of a circulatory system through which surface springs are retained; they are the breeding places of animals and of birds, those able but unrecognized farmers' friends. And lastly, they add beauty to the scenery. What we love we will preserve.

"The members of this Institute could each do a share to implant in the young mind the beauty and comfort of trees—then the profit.

"A property that is beautifully set amidst trees, is an addition to the community. Many, or most of the rural homes of our country stand devoid of these natural adornments. All rural school grounds lack them. Frequently lengthy roadways to a home subject one to unprotected heat in summer and bleak winds in winter.

"With all the beauties nature has so generously lavished upon us, how little we are retaining! Parts of our country become less and less lovely as the years pass by. Roads that should have been left as avenues, delightful to travel, have been ruined by cutting down all border trees. Lakes are fringed with ugly stump lands, no trees left for cattle shade, nor for beautifying the margin of water.

"Now there is a profit in natural beauty. I have been told that England holds in its rural districts so much that is charming that the tourist finds vast enjoyment in its paths, roads and streams.

"It is a fact that American cities and towns reveal more pride in trees than do the rural districts. Bridgewater, I think, evinces generally a more pleasing appearance in its residential quarters, solely through the care of trees than some portions of the surrounding sections do with all their better chances. Care for the trees you have! Plant new ones. Keep alive the spirit of forestry.

"I will close with two thoughts of Ruskin: (1) 'It is the law of economy to make the best of everything.' (2) 'Everyone is intended to find an exquisite happiness in one's own best efforts.'"

NEWSPAPERS.

They sent my forest to a paper mill,
My forest, lifted solemnly and still
For skies to brood and morning sun to kiss,
Now torn to pulp and flattened into this—
This endless mass of paper, smudged with ink,
And flung abroad to men that will not think.

Instead of sweet green leaves, this dingy white;
Instead of bird songs and the pure delight
Of sturdy trunk and loving shadowy bough,
The berry glints, the asters—nothing now
But crumpled pages whirled beneath a train,
Or sodden in a gutter by the rain.

Ah, when, thou monstrous Press, thou mighty force,
When wilt thou bear thee worthy of thy source?
When, in the glad remembrance of the wood,
Wilt thou be soundly sweet and staunchly good,
Fragrant and pure and masterfully free,
And calmly strong as thine our parent tree?

Amos R. Wells, in Harper's Weekly.

TESTING POPLAR GROWTH.

The practicability of growing cottonwood (poplar) for pulp making was recently presented at a public meeting by Mr. R. T. Houk, Secretary of the Mead Pulp and Paper Co. of Chillicothe, O. Trees planted by the company four years ago, 1,000 to the acre, he said, would be harvested in 12 years. Mr. Houk said the growth was one inch a year in diameter and he had witnessed two inches a year in the Mississippi valley. The United States Forestry Department are closely observing the experiments.

With the Forest Engineers.

Dominion Forest Branch Notes.

Mr. J. A. Doucet, Forest Assistant, who has been engaged for the past year in gathering statistics in the province of Quebec, left on April 8 to take up his duties in charge of the survey party which is to make a reconnaissance survey in the Peace River country. His headquarters will be Spirit River Settlement, via Edson, Alberta.

Mr. Doucet will be assisted by Mr. R. D. Macdonald, who after finishing the work in connection with the traverse party which operated in the Clearwater Reserve during the season of 1914, spent the winter at Head Office assisting in completing the report and maps of that survey.

Mr. George S. Smith, who has been working at Head Office in connection with the grazing policy of the Forestry Branch, left Ottawa on April 10 to take up his duties as Forest Assistant in the Big River and Sturgeon Forest Reserves, Saskatchewan. His headquarters will likely be Big River, Sask.

Mr. W. N. Millar, Assistant Professor at the Toronto Forest School, and formerly Inspector of the Alberta Division will during the summer visit forest reserves in the West with the object of gaining data to assist in perfecting the organization and in developing scientific investigation of timber growth in the prairie provinces.

Dr. B. E. Fernow, Dean of the Toronto Forest School, will spend some time in the West this summer and will visit some of the reserves with a view of gaining a better knowledge of the conditions on the reserves, where a number of the graduates of the forest school are now employed.

Toronto Foresters' Club Dinner.

Owing to a mistake no mention was made at the time of the successful annual dinner of the Foresters' Club of the Faculty of Forestry of the University of Toronto. The chair was occupied by Mr. C. H. Morse, President, and there was a good number of guests besides a full attendance of members of the Club.

The speakers were Prof. J. W. Toumey, Director of the Yale Forest School, who spoke on "Forest Law Enforcement in the United States"; Mr. R. H. Campbell, Director of Forestry, who spoke on "Dominion Forestry"; Mr. H. R. MacMillan, Chief Forester of British Columbia, on "Forestry in British Columbia", and Mr. Clyde Leavitt on "Forest Conservation."

Among the other guests were Mr. E. J. Zavitz, Provincial Forester of Ontario, and Mr. G. A. Gutches, District Inspector for Saskatchewan.

Eastern Limit of Douglas Fir.

Mr. J. R. Gareau, formerly of the B. C. Forest Service, and now one of the field officers of the Intermountain Division of the Department of Agriculture, Ottawa, wrote under date of December 1914 from Stanford University as follows:

"This is a suggestion to foresters (chiefs of parties) to send in their summer's work.

"My third and last summer in the B. C. Forest Service was spent in the northern part of the province. My work was, in character, similar to that of the two previous seasons, and consisted in a reconnaissance study of the forest conditions in the basin of Willow and Bear (now called Bowron) rivers, two streams of over a hundred miles in length which empty into the Fraser river within seventy-five miles above Fort George.

"The season's work was of great interest from more than one viewpoint, but particularly from that of forestry, and of the data, I have collected and observations I have made, the following might not be entirely devoid of interest to those foresters who take some interest in the scintific aspect of our branch of applied botany. Two of the things I have observed are: On the one hand, the fires which at different times swept over that region, and on the other, the distribution of forest tree species, and the relation of the one to the other, particularly in the case of Douglas fir, with which species this note is concerned.

"In the Department of the Interior Atlas of Canada, Map No. 9, "Limits of Forest Trees," the eastern limit of Douglas fir, between the 53rd and 54th parallels of latitude, is indicated by a line that follows the course of the Rocky Mountains between the Fraser river and its tributary, the Willow river. This, I found to be incorrect.

"The error in fixing there the eastern limit of Douglas fir, in that particular region, is to be attributed, no doubt, to the rarity of that species east of that line. It is comparatively rare, yet it is found over a wide area and its mode of occurrence as well as the characteristics of individual trees force me to conclude that it was there once in much greater quantity.

"Throughout the basin of Willow and Bear rivers, from valley bottoms to the mountain sides at elevations as great as 4,100 feet above sea level, I found isolated individuals of Douglas fir, or small groups of them, and in a few instances this tree formed the dominant species of the stand over an area of from two to three square miles as far as time permitted me to ascer-

tain but possibly of a greater extent) as on the southern slope of the mountains northwest of Stony lake.

"These trees are all big and tall, apparently very old, and in the bark and wood of the lower part of the trunk of many of them can be seen traces of fires. I have also found in many places, in dense stands of big spruce and balsam, old, dry, partly burned stumps of the same species (Douglas fir) which I take as a further evidence that Douglas fir formed a very important part of the forest which this region at one time supported, and that its almost complete annihilation in that region, and the present and new type of forest, is the result of large and repeated fires.

"The foregoing also leads me to believe that, although I am not acquainted with the country lying north and south of the ground which I have examined, a line with slight zigzags running from a point a short distance west of Calgary (assuming that the eastern limit is correctly indicated at that point on the Atlas) to a point slightly northeast of Ft. McLeod, for the eastern limit of Douglas fir, would be nearer the truth than the present one with its big inward curve between the same two points, and which I have proved to be in part incorrect.

"It is the privilege of the man doing reconnaissance work to see much country, and as he has thus the opportunity to gain a knowledge of the 'variation' in the forest which corresponds with changes of the physical conditions, a few summers' work in that province is of great instructive value.

"British Columbia, with its diversity of topography and climate, is surely a great forest laboratory and some knowledge of her forest regions should be to those of us young Canadian foresters who have been there, a valuable prerequisite or fundamental for our further studies."

FIRE PROTECTION ALONG RAILWAYS.

Mr. Clyde Leavitt, Chief Inspector of the Board of Railway Commissioners for Canada, writes approvingly of the advanced fire protective methods of the Boston and Maine Railroad. Besides following the general practice of railways in burning off the right-of-way, each year, this company co-operates with the land owners, along their lines, in disposing of inflammable debris on a narrow strip on each side of the right-of-way. Old slashings, outside tracks, greatly increase the menace from fires which may start in dry grass, within the right-of-way. The company clears this outside area at its own expense when it is impracticable for owners to do so safely. It is reported that, in a year, the fire hazard was reduced in 75 places by this policy. The method is inexpensive as the railway sectionmen do the fire protective work on rainy days, when it is safe, and track work would be suspended anyway. Mr. Leavitt observes that the policy is good from a business standpoint. It reduces damage claims against the railway and the elimination of forest fires tends to increase freight and passenger revenues.

A LESSON FROM CHINA.

Clarence How, in an article in World's Work on a recent visit to China, and the lessons he learned there, says the most important lesson he learned was as to the need of conservation of the forest resources of America. "Hardly anything that I saw on my whole trip," he says, "burned itself more deeply into my memory than the heavy penalty that the Celestial Empire is now paying for the neglect of her forests in former years. In the country north of Peking I found river-valley after river-valley—once rich and productive, but now become an abomination of desolation—covered with countless tons of sand and stone brought down from the treeless mountain-sides. So long as these slopes were forest-clad, the decaying leaves and humus gave a sponke-like character to the soil upon them, and it gave out the water gradually to the streams below. Now, however, the peaks are in most cases only enormous rock-pikes, the erosion having laid waste the country round about; or else they are mixtures of rock and earth, rent by gorges through which furious torrents rush down immediately after each rainfall, submerging once fruitful plains with rock and infertile gully-dirt. Where the thrifty, pigtailed Chinese peasant once cultivated broad and level fields in such river valleys, he is now able to rescue only a few half-hearted patches by piling the rock in heaps and saving a few intervening arable remnants from the general soil-wreck."

DO OUR PART.

And yet, while "we, the people" are worrying about the details of tariffs, ballots and the like, one is tempted to forget the importance of the conservation of our natural resources and especially the conservation of our forests, which is such an important factor, not only in the lumber industry but in the flow of our rivers and the rainfall on our farms. Moreover, we must not depend upon our presidents and Congress to do all this work of conservation for us; we must each do our own part.—*Philadelphia Post.*

FORESTRY IN MAINE.

The State of Maine is doing considerable to reforest its waste areas. The legislature has authorized tax rebates, bonuses, assistance of the forestry department and sale of nursery stock, at minimum prices, to owners of unproductive lands who establish and maintain forest tree plantations on them. A large number of trees were distributed, last year, from the nursery, recently started in the forestry department of the University of Maine. The variety of trees produced there is large, though 75 per cent are white pine. Norway spruce and European larch are also extensively grown.

Prof. John M. Briscoe, head of the movement to persuade farmers to reforest their waste areas, urges landowners to plant a stand of white pine upon their unused lands for the results it will ultimately yield. His compaign is arousing interest among all engaged in lumbering in any form, as well as among owners of timberlands for the results it will utimately area of Maine is either in forests or waste land and that one-third of the population derive all or part of their income from forests or the waterpowers connected with them.

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The Membership Fee is one dollar per year. Members receive free of any additional charge the Annual Report and *Canadian Forestry Journal.*

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Canadian Forestry Journal

VOL. XI. OTTAWA, CANADA, MAY, 1915. No. 5

Forest Fire Probabilities in 1915

The outlook for a summer season comparatively free from serious forest fires is decidedly hopeful. Reports secured by the Canadian Forestry Journal from officials in control of large areas in Ontario, Quebec, and the Maritime Provinces state that rain has been falling in abundance and that the green undergrowth is developing to a marked degree. These facts stand out in striking contrast to the 1914 forest conditions when during April and May severe drought had made itself felt, unbroken by more than occasional showers, and the forest floor was parched and ready for ignition.

"DISTINCTLY BETTER."

"Our reports show a very hopeful condition in regard to the probability of dangerous fires this year. The rains have been heavy and the ground is moist and covered with fresh vegetation—distinctly better than a year ago," is one of the statements made to the Canadian Forestry Journal and duplicated in its essentials by other limit holders in Ontario and Quebec. A Nova Scotia correspondent reports heavy rains and a very good prospect in regard to fire immunity. Many of the Quebec lumber companies sent their rangers into the woods a week or two earlier this year and the extinction of several incipient fires in valuable parts of the limits towards the end of April well repaid the precaution.

IN THE WESTERN PROVINCES.

Throughout the Western Provinces the spring came early and with high winds in many places. Fires started earlier than usual and for a time during the month of April the condition looked serious. Fires were reported from British Columbia and also in the northern parts of Alberta and Saskatchewan, and it looked as if the season was likely to result in heavy loss. Fortunately during May rain has fallen generally and the situation is now under control so that, the spring danger having passed, the prospects for the season seem favourable.

ACULTY OF FORESTRY
MAY 2 1915

How Switzerland Cuts the Tax-Rate By Forest 'Harvesting'

The municipal forests of Aarau, Switzerland, produce an average gross profit of $14 per acre.

The richest state forests of Germany seldom surpass a revenue of $5.60 per acre.

Temperatures, winter and summer, modified by the thick forest regions.

Landslides, torrents and avalanches rendered impossible in many places by proper care of pine trees.

Switzerland uses for forest purposes chiefly land unsuited for agriculture.

By Marie Widmer.

(Contributed to the *Canadian Forestry Journal.*)

More than one-fifth of the whole area of Switzerland, *i.e.*, 21.86%, is covered with forests, and this proportion increases to 28% when one considers the area of the productive land only. About 67% of these forests belong to individual villages or cities; 28.5% are private property, and 4.5% only pertain to the individual cantons. The ownership by canton, village or private persons shows a remarkable variation in the case of each canton and we thus find that the cantonal governments of Valais, Ticino, Grisons and Uri possess practically no forests. The biggest percentage of forests owned by villages, *i.e.*, 94.3%, is however found in the Valais, and the greatest percentage of private-owned forests, *i.e.*, 78.8%, is to be found in the canton of Lucerne.

A VARIED SHOWING.

Generally speaking, we encounter the most extensive forest conservation, *i.e.*, in a proportion of 31-42% of the whole territory available for cultivation, in the Jura, and the cantons of Basel (Land), Schaffnausen, Aargau, Soleure and Neuchâtel have thus the greatest number of forests. Geneva, Basel (Stadt) and Uri find themselves in a reverse position, having to import most of their timber, and the Alpine cantons of the Grisons, Valais and Obwalden show a timber production which exceeds by far their own requirements.

The timber production of the Swiss forests generally has reached the comparatively high figure of 40 million francs a year. The average annual export amounts to about 3 million francs, but there is still an annual importation of wood for about 30 million francs. This somewhat surprisingly big import is explained by a continually increased demand for wood by the paper industry, also by a much developed building activity.

A PAYING PROPOSITION.

The statistics available concerning the average increase of the Swiss forest cultivation do not yet suffice by far for an approximate valuation of the respective financial returns. However, in all those cases, where it has been possible to investigate the question, the proposition has proven itself a paying one.

Thus it is shown for instance that the municipal forests of Aarau produce an average gross profit of $14 per acre, those of Zürich, Winterthur and Morat $12 per acre, and the most recent statistics in the case of Winterthur indicate a revenue of $14.90 per acre. Admitting that these are somewhat exceptional instances, we nevertheless find that the general results of the cantonal forests of Aargau and Zürich reach a gross profit of $8 per acre, while the richest state forests in Germany scarcely ever surpass a revenue of $5.60 per acre. The returns in the Jura and the Alps, where the soil is naturally poorer, amount to $3.25 to $4.80 per acre.

This steady and ever increasing revenue yielded by the forests helps to reduce taxation in Switzerland to a minimum.

It must also be remembered that these forests frequently occupy land which would not be fitted for any other cultivation and that their very presence has, moreover, an immense climatic and hygienic value.

TREES AND CLIMATE.

No place becomes oppressive from the summer's heat or unpleasant through the winter's cold if it is situated in a forest region. It is an established fact that all the renowned Swiss health and pleasure resorts are in closest vicinity to woods and forests whose purifying presence and wholesome fragrance acts like a tonic on the human system.

In certain mountainous regions where landslides, torrents and avalanches would otherwise cause fearful havoc, the forests alone can ward these disasters off. This is the reason why every pine is held sacred in those districts, and why but small tracts of forests are denuded at one time and are immediately replanted.

What Newfoundland Does To Safeguard Her Forests

(Contributed to the Canadian Forestry Journal by Hon. P. T. McGrath, St. John's, Nfld.)

Newfoundland's measures for the protection of her forests are directed mainly by a Fire Patrol Board. This is a voluntary committee to which the Government and the leading holders of timber areas are parties. The Minister of Agriculture and Mines is Chairman ex officio and the Government grant [illegible] towards the [illegible], the timber licensees supplement by a somewhat similar sum, so that annually there is available from $8,000 to $9,000 for the purposes of the Board. The forest areas through the interior of the country on either side of the transinsular railroad which traverses the Island, are divided into sections, each of which is supervised in most cases by the manager of the company controlling the timber areas in the immediate vicinity. None of these persons received any salary whatever and all the employees engaged in each section are hired and discharged by the superintendent, report to him and carry out his directions, while general reports and time sheets are sent to a general secretary who happens to be at present an official of one of the lumbering companies and who receives a small honorarium for his services in this capacity. In addition, the Government places at the disposal of the Board the services of the chief forest ranger of the Island, who has, on his own part, extensive powers to employ men and equipments to fight forest fires wherever these may be raging.

All the principal areas which are now being worked in the Colony are connected by telephone with the superintendent of that particular section, and there are public and railway telegraph lines along either side of the railroad and telegraph offices at all stopping points, so that every facility is thus provided. During the winter months, of course, there is comparatively no fear of fire in the wooded country, and in the summer, when dam building and other work is carried on, only trusted men are employed, and the "bosses" are such as may be trusted to take every precaution to prevent fires spreading.

The service so far, and it has been in operation for five years, has been very satisfactorily performed, and no serious forest fire has occurred in the principal wooded areas of the country since its inception. Elsewhere throughout the Island, inland from the seaboard, where it is difficult to maintain an efficient service of fire wardens, except at a cost utterly beyond the means of the Colony, there are such fires from time to time, but those engaged in the lumbering industry in the Colony and familiar with its conditions, are satisfied that no country on this side of the Atlantic is now so well protected, all things considered, as is Newfoundland.

No methods of conservation of the forests are practised in this Island. The experience of all engaged in the lumber industry is that when an area is cut or burnt out the new growth comes up too quickly to render such necessary, and while in the natural order of things the rule of the survival of the fittest applies in our forestry problems, the quickness with which wood grows to a size suitable for pulp wood renders scientific measures entirely unnecessary.

Government Railways Adopt Protective Rules

The railway lines operated by the Department of Railways and Canals have been placed by the Minister, Hon. Frank Cochrane, under the same fire protection regulations as are imposed by the Board of Railway Commissioners on all the company-owned systems. This signifies a most important step in the cause of forest protection, inasmuch as the territory traversed by the National Transcontinental from Moncton to Winnipeg is heavily wooded in nearly all sections, while the forests contiguous to the Intercolonial tracks, although injured by fires of the past, are still well worth the utmost precaution. Co-operative measures have already been set in motion by the Governments of Ontario and New Brunswick, acting with the Federal Department of Railways, having in view the efficient patrol of the railway lines within the provincial borders. Action of a similar character is under consideration by the Government of Quebec.

The Two Masks of Destruction.

When an army of marauding Germans laid hands on Belgium, placed the nation in formal slavery, and ruined or sequestered the national domain, 100,000 Canadian citizens put on the King's uniform and pledged themselves to evict the trespasser.

Belgium and France have lost, through the violence of gun fire and other practises of war, enormous quantities of beautiful and almost priceless forest. A hundred years will scarcely restore these wrecked woodlands to the condition of August 3rd, 1914.

War is just one brand of Destruction. It appals because it takes toll of the priceless human. It amazes because it lacks the accidental factor of most other destruction.

If foreign guns smashed down ten million dollars worth of Canadian forests in a brief twelvemonths' campaign, can anyone picture the burst of patriotic resentment arising through town and countryside? Governments would concentrate every resource to oust the invader; no other task would be known in the land until the rescue of the forests had been accomplished.

Canadian forests are falling every month of every year beneath the onslaught of Fire. Guns or Fire—it makes no difference except that cannon are surpassed by Fire in thoroughness. Fire is an invader, a national and individual foe. He will ruin our splendid annual forest crop of 172 million dollars if his power is not stayed. He will dry up the rivers and waterfalls, develop damaging floods, impoverish the farm lands, and leave the whole nation poorer.

Fire is as much a national trespasser as a line of hostile regiments. He deserves to be handled with the same steadfastness, the same vigilance, the same ingenuity.

Forestry experts have calculated that lumbermen have cut since Confederation over a billion and a quarter dollars worth of Canadian trees.

While five or six billion dollars worth have been sacrificed to fire.

Is this the sort of national record worth perpetuating?

[Photo by Underwood and Underwood

ONE BRAND OF DESTRUCTION.

German shell fire concentrated for a few minutes on the area shown in the above photograph smashed and stripped a patch of timber into a few useless skeletons. The picture was taken in Northern France.

ANOTHER BRAND OF DESTRUCTION.

This is not the result of shell fire but of forest conflagration. The scene is in Muskoka. Repeated burning, mostly preventible, has killed off the timber, burned up the soil and left in their place an area of worthless rock. As it takes 300 years to build up an inch of soil to give scant nourishment to a new forest, these burned areas of Muskoka can for practical purposes be wiped off the ledger of Canadian assets.

NEW BRUNSWICK'S STAND.

The N. Y. Paper Trade Journal, referring to recent New Brunswick legislation, says:

"We will not say that the regulation providing that no timber be cut below a certain size is not a wise and necessary measure. There has been altogether too much prodigality in the cutting of the forests as Americans have found to their cost, and conservation has become a watchword on both sides of the line. But a country can suffer just as readily from a hoarding of its resources as it can by a wasteful policy. If this was a time when capitalists were seeking investments in Canadian properties for the purpose of paper manufacture, as they were doing when Ontario and Quebec first began to impose export restrictions on wood, it would be possible to understand the present attitude of the New Brunswick government. But when there is no prospect for additional mill construction in the Dominion except at some remote and indefinite period, and when it has been found that the prohibition of pulp wood shipments to this side has not been productive of a single paper mill within the province, is it not poor business policy to withhold the raw material when it might be sold to advantage and profit?

"Ontario has the right idea. Her restrictions have been elastic. She raises and lowers the bars as circumstances dictate, with the consequence that she has at all times a revenue from her resources."

Vigorous Reforms in British Columbia Despite Bad Fire Season

Four outstanding features characterized the forest administration in British Columbia for 1914. The Timber Royalty Act was passed, defining for half a century ahead the stumpage price of Crown timber. The Forest Branch successfully struggled with one of the worst fire seasons. Revenue was well maintained despite the war and financial depression. Explorations were made confirming previous conjectures as to the large amount of timber remaining to the Crown reserve.

The report of the British Columbia Forest Branch for 1914, made by Mr. H. R. MacMillan, Chief Forester, to the Hon. William R. Ross, Minister of Lands, gives an excellent survey of the work being done in connection with the timber industry of the western provinces.

During the twelve months ending December 1st, the Branch collected $2,157,019, the net decrease compared with 1913 being only $325,770. The amount collected as royalty, stumpage, etc., was $467,380 as to $536,179 for 1913, the decline in operations being accounted for by the war and general financial conditions. The estimated general administrative expenditure for the fiscal year ending March 31st, 1915, is $254,204. On account of the severe fire season the expenditure under the Forest Protection Fund, to which the government and limit owners contribute equal sums, reached $394,758 as to $318,600 in 1913. However, $18,000 of the 1914 outlay is to be refunded by the railway companies.

RESULTS OF RECONNAISSANCE.

Nearly a million acres of merchantable Crown timber were reported by reconnaissance parties. These areas have been marked on the official maps to be protected from alienation. Altogether, 12,000,000 acres were reported on during the year on which 5,000,000 acres of statutory timber land were located. This carries a stand of 30,000,000,000 feet of merchantable forest

The saw mills of the province are given as: 180 up to 15 M. feet daily capacity; 96 between 15 M. and 40 M.; 58 over 40 M., and 81 shingle mills.

The report emphasizes the fact that there is no lack of timber to cut and no lack of mills to cut it. But a market must be sought. The population of the province, which in 1912 and 1913 used one-fifth of the lumber, does not now use one-twentieth. The only important market is the Canadian prairie which, in any single year, never took over 60 per cent. of the output of the mills. The export market in any one year of the past decade has not taken over 4 per cent. The yearly capacity of the 334 saw mills is given at 2,555,570,000 feet. From 1,000,000,000 to 1,200,000,000 had been cut annually for the prairie trade, but last year owing to the building depression the quantity fell to 700,000,000 feet and this was not all delivered.

In order to extend the market it is recommended that production must be cheapened to meet American cost. More lumber could be sold to the prairie farmers. The export trade might be developed with the United States east of the Mississippi, Australia, the Orient and Europe. The war brought a sudden flood of orders to pulp and paper mills. Paper shipments reached 45,816 tons and high-class chemical pulp 10,698 tons, despite shortage in available shipping. To minimize the effects of the war on the timber trade, restrictions on the export of logs were temporarily relaxed.

FIRST FOREST RESERVE.

The first provincial forest reserve in British Columbia was established on December 31st, 1914. It includes lands in the Elk river valley of an area approximately 100 square miles. The Alberta line forms its eastern boundary.

The total damage caused by forest fire is given at $436,532 compared with $18,354 in 1913 and $629,915 in 1910. Last year there were 1,832 fires, covering 355,124 acres. In 1914, 190 regular forest guards were employed as to 159 the previous year. There were 115 extra patrolmen and lookout men compared with 65 the year before. Although the staff was much larger, the expense increased only from $206,000 to $214,000 for the fire patrol force. Scarcely any variation occurred in the chief causes of fires, campers and travellers being still responsible for most of them.

Mr. F. C. Manning, who has been employed in connection with the Canadian Pacific Railway Company's Department of Natural Resources, has been appointed to the position of forest assistant in connection with the Clearwater Forest Reserve, with headquarters at Rocky Mountain House, Alberta.

Mr. K. Vavasour, of the University of New Brunswick Forest School, has been appointed to the position of forest assistant in connection with the Porcupine and Pasquia Forest Reserve, with headquarters at Hudson Bay Junction.

The following are the officers of the Canadian Society of Forest Engineers, elected to serve for three years: President, Clyde Leavitt of Ottawa, Forester to the Dominion Conservation Commission and Chief Fire Inspector for the Dominion Railway Commission; Vice-President, H. R. MacMillan, Chief Forester of British Columbia; Secretary-Treasurer, Ellwood Wilson, Forester to the Laurentide Company, Ltd.

Forest Assistant L. C. Tilt has been appointed to the Manitoba Inspection Office at Winnipeg.

"A Woodsman of the West" is a highly entertaining volume from the pen of Mr. M. Allerdale Grainger, of the British Columbia Forest Service.

Messrs. G. D. McKay and Arnold Hansson have been elected active members and Mr. B. K. Ayers an associate member of the Canadian Society of Forest Engineers.

The Third and Fourth Year students of the Faculty of Forestry, University of Toronto, to the number of thirteen, spent a week of practice work at the Provincial nurseries at St. Williams, as a part of their course in Silviculture. The work consists in getting practically familiar with the growing and handling of plant stock, setting out plantations with different tools and learning to appreciate their relative value. Each student is given a chance to perform all the manipulations from preparing and sowing seed-beds, transplanting seedlings in nursery rows, and planting into the field or woods.

It is expected that the graduating class will comprise nine names. Out of the fifty registrations at the beginning of the academic year only forty-two held out to the end, a number enlisting for the war and a few dropping out for other reasons.

Altogether, as far as known, some eighteen graduates and undergraduates of the Faculty have enlisted, of whom six were registered at he beginning of the session.

Apparently, the market for foresters has also suffered by the war like other employment, not all graduates securing places, as has been hitherto the rule, and only a few students of the lower years securing summer employment in the Forestry Branch.

Dr. Fernow expects to join Mr. R. H. Campbell, Director of Forestry, in making an inspection tour this summer over the federal forest reservations with a view of advising as to their handling from the forestry point of view.

A small amount of [illegible] in the Tilden settlement [illegible] and a locomotive during the summer and burned wood instead of oil for one day. On this day fifteen fires started along the right of way. During the preceding [illegible] years [illegible] railroad and it was not thought that the engine was responsible for that one.

A Contrast in Railway Methods.

A Canadian railway right-of-way well cleared and presenting a minimum fire risk.

Another kind of right-of-way. Here the ground has received very little attention. The grass and shrubbery are in an ideal condition for fire.

Railways fail to shift responsibility for fires near tracks

Upon the application of the Canadian Pacific Railway, the Railway Commission held a hearing April 6 at Ottawa, in connection with that portion of the Board's General Order No. 107, which places upon railways the responsibility for extinguishing fires which occur within 300 feet of the track, unless in each case the railway in question shall show that it was not responsible for the origin of the fire. The contention of the C.P.R. was that this clause should be eliminated from the order, so that the railways would be primarily responsible for the extinguishing of only such fires outside the right of way as should be positively known to be due to railway causes.

BOARD NOT CONVINCED.

The showing made by the railways was not sufficient to convince the Board, and the application was dismissed, with, however, the understanding that, should they see fit, the railways might later re-open the matter on the basis of requesting a reduction in the 300 foot limit, should they be able to secure sufficient evidence to justify such action. It has been suggested that possibly a reduction to 200 feet might be justified, and the matter may be re-opened later on something like this basis. It would seem necessary that as a result of the hearing of April 6, the principle may be considered definitely and finally established in Canada, of placing the onus on railway companies to be responsible for extinguishing fires which occur on or near their rights of way, except where the companies can show that specific fires were due to other than railway causes. That this is a progressive and necessary provision is being recognized to an increased extent on this continent, and it has not yet been shown that it imposes a sufficiently severe handship on railways to justify the sacrifice of public interest which would be involved in its abandonment.

CO-OPERATION NEEDED

There is, however, no doubt that, in full fairness to the railways, there should be a greater degree of co-operation on the part of the Dominion and Provincial Governments and timber owners, particularly in reducing the fire hazard resulting from the large accumulations of inflammable debris on lands immediately adjacent to railway rights of way. A beginning has been made in this direction, but for the most part the situation is urgently in need of attention.

From Other Editors

"The announcement by the Surveyor-General of New Brunswick that 'the Government intends to look carefully into the large quantities of pulpwood exported from the Province and will put an end to the cutting of undersized timber by cancelling the licenses of those parties found guilty of the practice' will be greeted with approval by all interested in the development of the Province s resources providing the Surveyor-General understands exactly what he means by 'undersized.'"—*Pulp and Paper Magazine*.

"The *Canadian Forestry Journal* is the modest organ of an important movement. The last number shows what is being done in reforesting bare slopes and timber lands to prevent carrying away of soil in storms and to conserve the water supply, as well as to make once more productive timber land which has been mistakenly cleared for agricultural, and rendered entirely barren."—*Montreal Weekly Witness*.

Every Reader Should Fill in these Blanks.

Secretary,
Canadian Forestry Association,
Journal Building, Ottawa.

I believe that the following persons would be interested in knowing about the work of the Association and might be persuaded to become members:

Name.....

Address.....

Name.....

Address.....

Name.....

Address.....

Kindly mail this to the Secretary as early as possible.

Hon. Dr. Roche champions the work of Forest Products Laboratories

At the annual meeting of the Canadian Pulp and Paper Association, Hon. Dr. Roche, Minister of the Interior, uttered an important and interesting pronouncement in regard to the Forest Products Laboratories of Montreal.

"It gives me particular pleasure," said Dr. Roche, "to believe that in the development of Canadian resources the Forest Products Laboratories under the capable direction of Mr. R. H. Campbell, Director of Forestry, and our worthy friend, Dr. Bates, will be of great service to the Dominion of Canada. I must take no credit for the idea which led to the establishment of this institution, but it has been a privilege which I cannot overestimate to have been instrumental in some small way in the introduction of legislation and the other necessary arrangements which would lead to the organization of this institution in Canadian industrial life. I saw the advantages which the proposal offered and have given it my heartiest support during the time which I have held office.

The work which the Forest Products Laboratories are undertaking has enabled me to make such representations to my colleagues that there has been no difficulty in securing the support of the Government in the financial part, and I am sure that every member of the Government considers the money well spent.

THE NEW ACT A REMEDY.

"I should make mention of an evil which has beset the path of the Forestry Branch in times past which I have made an effort to remove. I refer to the failure to include under the Civil Service Act all the members of the Outside Service as well as the Inside Service. It has come to my notice that a very unfortunate condition exists in the personnel of the Forestry Branch, under which political patronage was made the standard of selecting men for office and position rather than through actual qualification. As you can readily understand, full efficiency under such a system is entirely impossible. It gives me very much pleasure to state that in the new Civil Service Act the law is so formulated as to remedy the conditions of which I speak. The leaders in the Canadian Houses of Parliament have agreed that this session shall be devoted exclusively to the momentous issues which this unfortunate conflict which is raging in Europe and testing the resources of the Empire has raised.

"There is no chance this year for the new Civil Service Act with the alteration to be law, but next session the necessary legislation will be accomplished, so that Mr. Campbell can carry on the important work of the Forestry Branch unhampered by the evils of the patronage system."

PROPER UTILIZATION OF FOREST WEALTH.

Mr. R. H. Campbell, Director of Forestry, followed Dr. Roche with an address referring to the Forest Products Laboratories and the forestry problems confronting Canada. In part he said:

"Gentlemen, the Honorable Dr. Roche, who has just addressed you, has pointed out the possibilities of the Forest Products Laboratories. From the first I have felt assured that these Laboratories would do much in rounding out the work of the Forestry Branch. I have also felt assured of the character of the work because of the action of McGill University. Not only is much of the valuable equipment of McGill placed at the disposal of the Laboratory staff, but co-operation by the members of the Engineering and Chemical staff of McGill is providing a very favorable atmosphere for the Laboratories and a proper stimulus to the men engaged in experimental work.

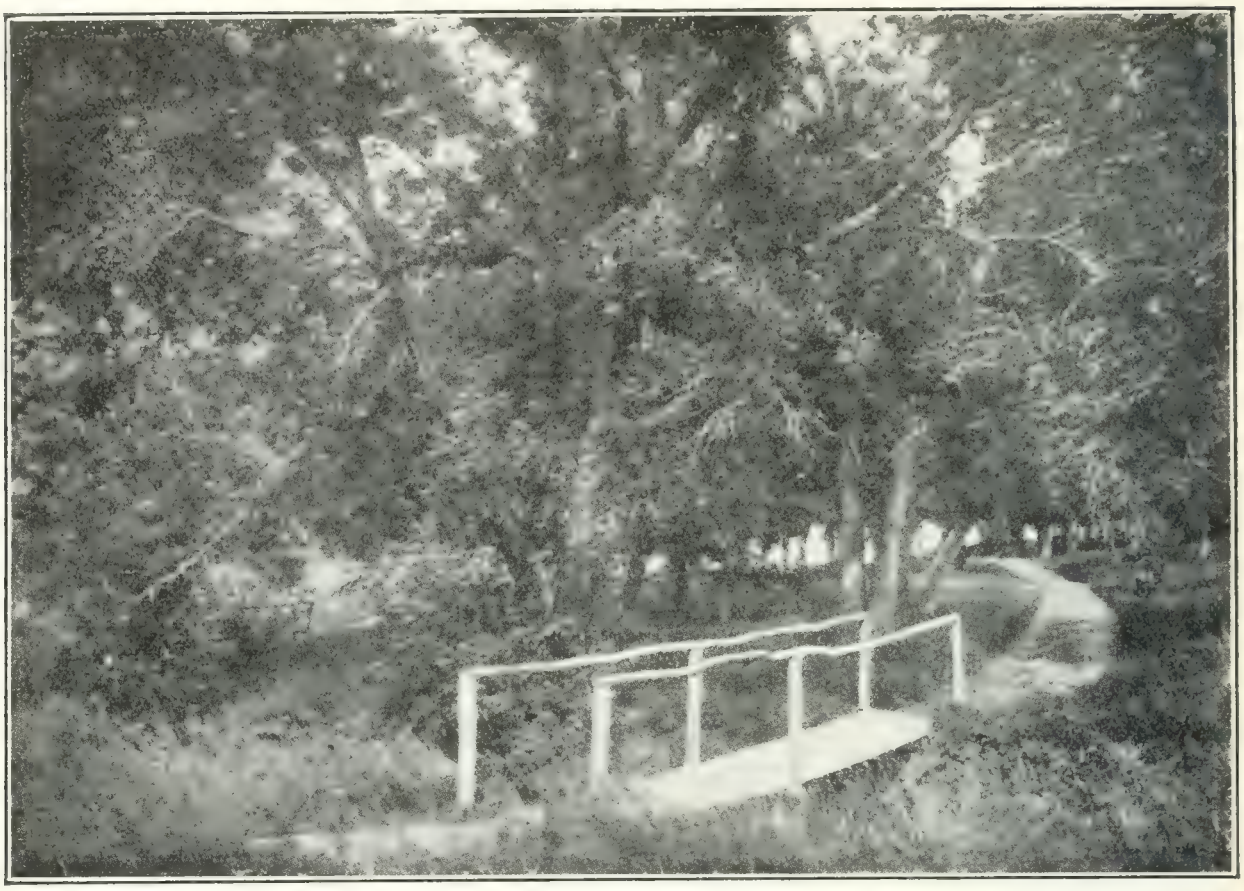
"As you know special stress in the matter of equipment is being laid on pulp and paper apparatus. A considerable sum has been set aside for the equipping of an experimental paper mill with all the necessary machinery for carrying on paper making processes. It has been a matter of satisfaction to the Department to see the hearty support which has been given to the Laboratories by the Pulp and Paper Association. Much depends upon the co-operation of the practical men in the industry, and I trust you will make all possible use of the Laboratories and lend your assistance in the working out of the problems that are most important to the paper industry in Canada.

"As we look at various European countries we are struck with the fact that forest conservation has been given great and serious thought. Germany, whatever may be our attitude toward that country at the present time, must be given credit for having made wonderful progress along the lines of growing crops of wood, although it is true that Germany was forced to conserve

her forests earlier than most other countries, on account of internal economic pressure. Germany stands to-day far in advance of Canada in scientific forestry methods and we are just learning the vital importance of applying scientific methods to forest conservation in this country. The forestry problems in Canada are of course quite different from those in a thickly settled highly organized country such as Germany where the forest area is relatively small and the planting of trees is practicable. The Forestry Branches of our Dominion and Provincial Governments are devoting their whole-hearted attention to the conservation of the forests coming under their jurisdiction by the development of fire fighting organizations, by the proper disposal of brush, by taking proper measures for the preservation of the existing forests and making provision for natural reproduction.

In addition to this we must learn to use the products of the forests in such a way as to make them of the greatest possible value to consumers and to the country. Other countries are devoting time and money to [illegible] and we must do the same in Canada if we are not to lag behind. I feel that there is much that can be done in studying the adaptability of various woods for the manufacture of valuable products and in the perfecting of processes in the pulp and paper and other wood using industries. The Forestry Branch, I can assure you, will do all in its power to promote the best interests of forest conservation and I trust that through the Laboratories we can be of real assistance in the study of improved methods of utilizing the raw material which the forest places at our disposal. The interest shown by the pulp and paper men at this annual meeting is very gratifying.

A good example of British Columbia forest at Cameron Lake.



This photograph shows what can be done on the 'treeless plains' if man will only give nature a chance. The picture was taken in Assiniboian Park, Winnipeg, which was set aside as a park only about five years ago. Some natural timber was growing in sections of it, but tree planting was successful in developing the area into a fine public playground.

If you know these Facts, tell your Neighbor !

The forest products of Canada are worth 172 million dollars every year.

No other crop compares with it in value. The wheat production is worth 50 million dollars a year less.

Yet the continuance and development of this enormous harvest of trees does not conflict in any sense with the enlarging of the wheat or any other agricultural crop. On the contrary, the preservation of the forests is the best guarantee of the fertility of the Canadian farm.

Forest Conservation has no quarrel with the reasonable and patriotic lumberman. Correct methods of forest management maintain and increase both the productiveness and the capital value of forest land and draw from it the best return it is capable of giving.

Forest Conservation does not mean a "Hands Off" sign on every area of trees. It means Care as opposed to Carelessness, Construction as opposed to Destruction, Good Use as opposed to Abuse. The Conservationist is not a faddist. He believes in cutting crops of trees with an eye to future as well as present profit. He does not look on a forest as a silver mine, to be gouged out as fast as possible and abandoned as a waste.

The Federal and Provincial Governments of Canada *own* 99 per cent. of the forest lands. A very considerable part of these lands are under lease, but the ownership remains vested *in the people*. The situation in the United States is a remarkable contrast. There, the people possess a title to not more than one-fifth of their magnificent timber resources. Whatever policy of forest conservation the Canadian people choose to adopt will blanket 99 per cent of the forest area of the country.

Your neighbor might like to know truths like these.

The Poplar Tree Friend or Foe ?

Editor *Canadian Forestry Journal*:

In your issue of April, 1915, No. 4, you call attention to the poplar tree and speak of it as a "farmer's tree."

My experience with poplar trees has been that they are the worst enemy of the farmer.

An experience which I have had with them has made a lasting impression. At my place at Lake George, seventeen years ago I planted several trees like maple and elm about the place. Some of these trees are now eight or ten inches in diameter and have a magnificent spread, while others have practically made no progress during all this time.

Around the shore of the lake I have a grove of different kinds of trees, and in one section there were a large number of poplars. My attention was called finally to the fact that as the distance was removed from these poplar trees the trees which had been set out on the place were more luxuriant in their growth; in fact, the trees that had been set out nearest to the poplar trees had not grown at all, while as the distance was increased the trees improved, and the ones that were the furthest removed from the poplars were the largest in growth.

Two years ago I decided to take out all of these poplar trees, and the result has been that the planted trees in their immediate neighborhood have grown more in the past two years than in the entire fifteen years previously.

This indicates very strongly to me that the poplar tree is a great robber of the soil, and, if my experience is borne out by others, instead of being the "farmer's friend," the poplar is one of his worst enemies.

Yours very truly,

R. C. TEFFT.

President, The Sandy Hill Iron and Brass Works, Hudson Falls, N.Y.

The position of City Forester is now offering a new field for men with a technical training in forestry. Fitchburg, Mass., is one of the latest towns to secure an official of this sort.

CANADIAN TREE SEEDS FOR CHINESE SOIL.

In this time of war many important movements which would attract attention at other times are going on almost unnoticed. One of these is the effort of educationists, government officials and missionary organizations to get the poor people of China back on to the land. This work is proceeding along different lines. As in other countries much of the soil of China is unsuited to any other crop than trees, and part of the effort is to get reforestation started. Last month the *Canadian Forestry Journal* had an appeal through Dr. C. C. James for tree seeds from one of the professors of the Agricultural Department of the University of Peking. This month we have to chronicle the receipt of a letter by Mr. R. H. Campbell, Dominion Director of Forestry, Ottawa, from Mr. J. H. Crocker, one of the Secretaries of the Young Men's Christian Association at Shanghai, China, thanking him for the gift of seeds of Canadian trees which have been distributed in this effort. Mr. Crocker states that a young Chinese student a graduate of an United States forestry school, is on their staff to take charge of this forestry propaganda, and he is sure that before long they will be getting results.

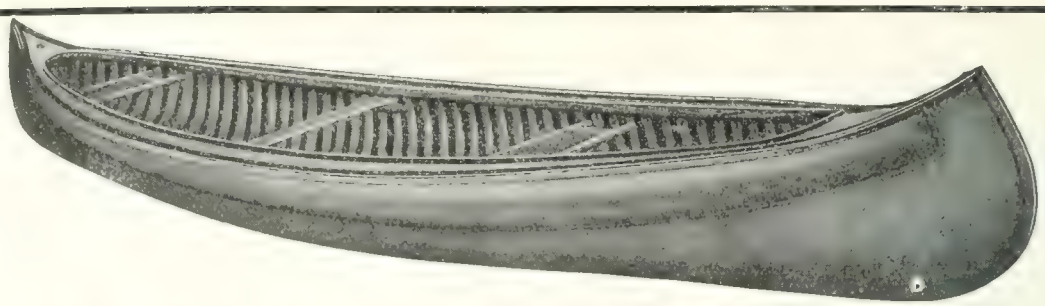
The whole world is awakening to the folly of denudation and to the need of reforestation, and Canada, with her great natural advantages and the advantage of the experience of all these older countries, must not lag behind.

B. C. WOOD SAMPLES FOR BRITISH AND FOREIGN MARKETS.

The campaign directed by the Hon. W. R. Ross, Minister of Lands for British Columbia, in order to educate the consumer in distant markets concerning the qualities and adaptability of British Columbia woods, has been advanced another step, the first consignment of the permanent exhibits to be stationed at important trade centres throughout the world, having been already dispatched.

The eight sets already forwarded will be on view at five trade centres in the United Kingdom, namely London, Birmingham, Manchester, Bristol and Glasgow, also at Paris, Shanghai and Yokohama, in the care of the respective Canadian Trade Commissioners, and cannot fail to attract the attention of importers.

There will shortly be sent out the balance of the exhibits, sixteen in number, destined for sixteen points in Australia, New Zealand, South Africa, the East and West Coasts of South America and Eastern Canada.



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NEW ZEALAND'S GOOD RECORD.

The report on the state nurseries and plantations of New Zealand for the year ending March 31st, 1914, made by James Mackenzie, under-secretary of the department of lands and survey, shows that since the formation of the nurseries in 1896, 65 million trees have been sent to the state plantations and 3½ million to outside places. The Forestry Branch was very active during the year under review. Eight and a half million trees were raised in the four state nurseries, bringing the total stock up to 17½ million trees. The total cost of the nurseries from their origin is £118,392. Last year's operations cost £9,357. Three of the seven nurseries, first established, have been closed.

On the nine plantations under operation 1,825 acres were planted during the year, bringing the total up to 22,458 acres, planted since 1896. The average cost per acre of the year's work is £5 17s. 5d. The plantations cost, since their establishment, £186,041. The total number of trees in the plantations is now 54,158,614, representing a cost, per thousand trees, of £5 3s. 8d. A considerable amount of prison labor is used on the plantations.

The superintending nurseryman of the North Island lays stress on the importance of importing seeds only from climates similar to where they are to grow. The strain of the parent trees is also important. Of American trees, the chief difficulty on these points arose with pinus ponderosa, on account of the wide area it occupies.

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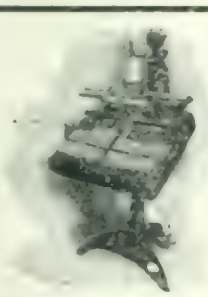
CANADA'S FORESTS FOR IMPERIAL USE.

That the interests of the British Empire demand a fuller investigation of the forest resources of Canada and Newfoundland was urged by Mr. Charles Phillips in a paper read before the colonial section of the Royal Society of Arts in London, England, on May 4. Sir George Perley presided.

The speaker urged as a matter of extreme importance that Great Britain should endeavor to supplement its foreign sources of supply of raw materials for the making of paper with those awaiting development within the Empire. He pointed out that the present dependence on Norway and Sweden might involve a serious problem if either of these countries should become a foe. In the exhaustive survey of the timber resources of the Empire available for paper-making, it was shown that Canada and Newfoundland led the way, both in materials and process of manufacture, but it pointed out that the Dominion Government recognized the importance of conservation.

A CANADIAN EXPERIMENT.

The departure of Mr. H. R. MacMillan, Chief Forester of British Columbia, for Japan, China, India and Australia, as a special trade agent of the Department of Trade and Commerce emphasizes a new sphere of activity for a Canadian forester. If the quest for new trade outlets for the British Columbia lumber mills proves successful, it will indicate a versatility of talent which the curriculum of forest schools perhaps did not take into account. Although Mr. MacMillan is the first Canadian state forester to put his shoulder to the selling end of forest production, the practice of thus using experts in some of the United States forest branches has been recognized for some time past.



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Minnesota's annual appropriation for forestry is about $233,000. The state forests amount to 43,000 acres. Massachusetts has 15,000 acres of state forests and 56 separate municipal forests.

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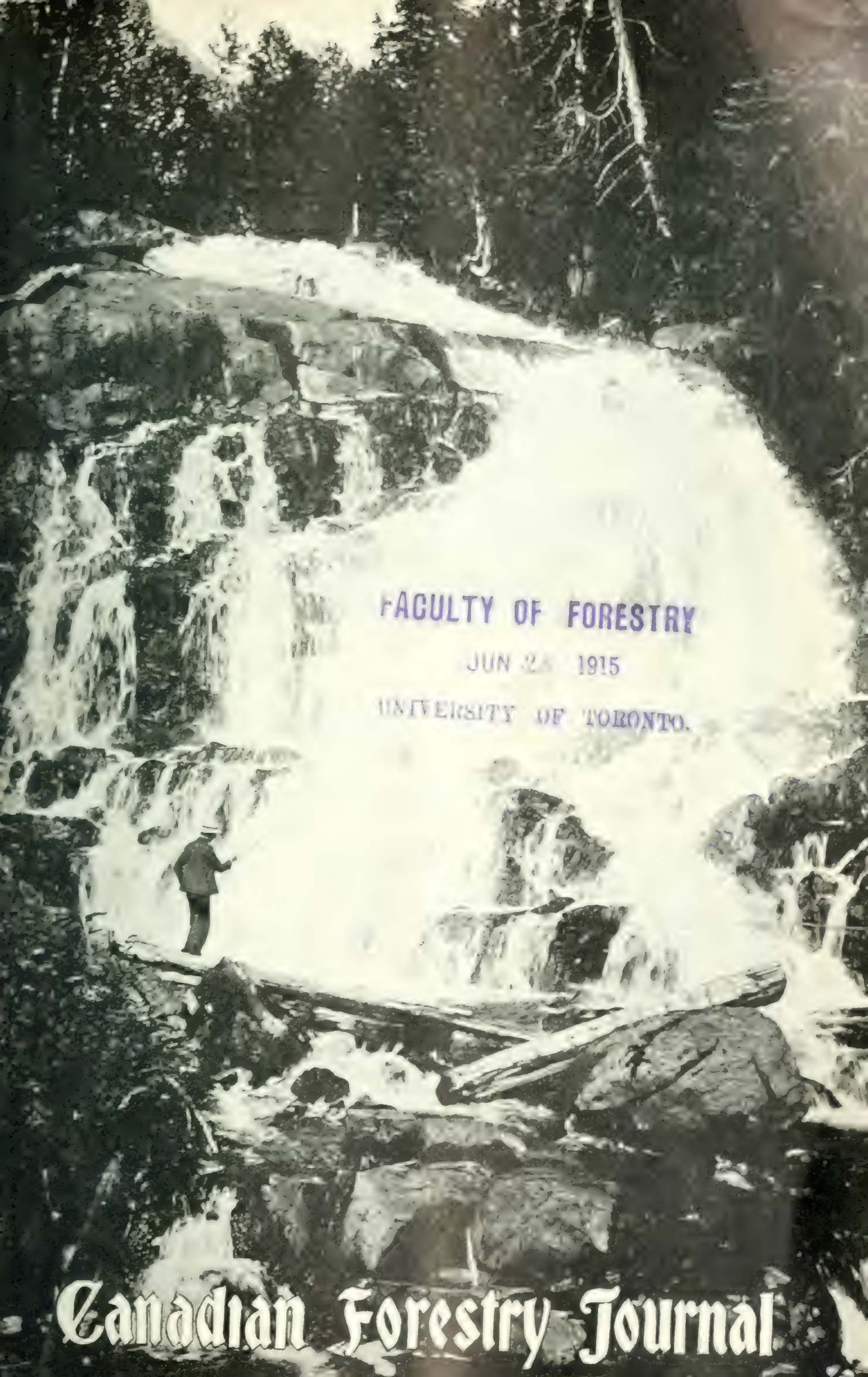

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Canadian Forestry Journal

VOL. XI. OTTAWA, CANADA, JUNE, 1915 No. 6

Forest Fire Situation

Prompt Action of Rangers in Organized Parts of the Timber Country has Averted Serious Danger

For a time in the early part of June, the sudden outbreak of forest fires in many parts of Ontario and Quebec threatened to upset the earlier calculations for a summer season of small losses. Fairly heavy rains following the period of unbroken heat relieved the situation temporarily, and at the time of going to press (June 15) reports received by the editor from many quarters indicate a cessation of fires without, thus far, many excessive losses of valuable timber.

It is a striking fact, however, that all these reports speak of the threatening character of the fire outbreaks and the probability of heavy damage had not qualified rangers been on hand to minimize the destruction. Particularly was this true of the territory patrolled by the St. Maurice Valley Forest Protective Association, under Mr. Henry Sorgius' management, and the Lower Ottawa Forest Protective Association under direction of Mr. Arthur E. Graham. The evidence of the location and fierceness of some of the June blazes proves plainly enough that lacking the fire rangers the members of these mutual bodies would have been heavy losers. Both these associations possess an efficient personnel and good equipment.

Reports from New Brunswick mention persistent and damaging fires which have taxed the vigilance of all responsible for forest protection. Not a little of this is said to be due to careless burning of slash by settlers who apparently selected the driest and most perilous season in which to set their bonfires going. Friends of forest preservation have strongly urged the application of the permit system which has had a good effect in British Columbia.

In Ontario, a newspaper report from Cochrane speaks of "heavy losses having been sustained along the line of the Transcontinental Railway during the past week (June 9) by forest fires. The fires raged for a distance of fully 70 miles along the railway between Cochrane and Kapuskasing. At the latter place, where several hundred prisoners of war are detained, fire for a time seriously threatened the camp. The prisoners were orderly and no trouble ensued, they themselves joining in the fire fighting."

In the Prairie Provinces the early spring made conditions dangerous for fire. In Alberta rain came frequently enough to keep down the fires, but in Manitoba and Saskatchewan there were a number of fires that threatened serious damage. By the exertions of the fire ranging staff and by fortunate showers of rain all of these fires have now been extinguished though not without the loss of some valuable timber. There should now be no further serious danger until the fall.

Who Owns the Forest Lands?

Canadian Governments, by Retaining Possession of Ground Title are Masters of the Future.

(By the Editor.)

Who owns the forest lands of Canada?

There is a very prevalent conviction that with the multitude of 'timber sales,' 'land grants' and 'subsidies,' etc., etc., as announced and talked about for half a century, the public must by this time have parted with a major slice of the forested country. The truth is that about 97 to 99 per cent of the woodlands from Coast to Coast today is government-owned. A considerable portion, of course, is under lease or license and is being cut over. When one makes the statement that only one or two per cent of Canada's forest lands are privately owned, there is no thought of confusing ownership of timber land with ownership of timber. A timber lease is commonly spoken of as an equivalent of ownership of both land and timber since the leaseholder cannot be ousted without strong proof that regulations have been disregarded. The real importance of retaining the title to the lands in the name of the people is the disciplinary influence upon lessees and the undoubted authority given to governments to define and enforce a better forest policy. The moment the public become convinced of the very clear fact that destruction of the forests by fire can and must be stopped, that moment will bring into being strict regulations capable of blanketing all but one or two per cent of the woodlands of Canada. Provincial governments may impose precisely what forest protective laws they believe necessary and practicable, and no stronger barrier will block the way than a terminable contract.

B. C.'S MERCHANTABLE TIMBER.

British Columbia's forest survey will probably establish more reliable figures than are at present available. The Royal Commission of Inquiry on Timber and Forestry in 1909 and 1910 was faced with so much conjecture in the evidence as to place a reserve on many of the findings. The original legend that the province had 182 million acres of forest was dissolved by Dr. Fernow who believed 30 to 50 million acres to be the truer figure, as far as 'merchantable forest' was concerned. These figures were again reduced by the Royal Commission's investigation. The final conjecture of this body was that under the jurisdiction of the Provincial Government was a forest area of 15,001,000 acres of merchantable timber inclusive of all reserved timber land and everything under tenure with the single exception of what is held by the C. P. R. which possesses very considerable privileges on Vancouver Island. In the total of British Columbia's timber land may, of course, be counted 11,000,000 acres lying twenty miles on either side of the Canadian Pacific roadbed and under jurisdiction of the Dominion Government. Some 1,280,000 acres of it were under timber license or permit at March, 1910.

The use of the term 'merchantable timber' is, of course, responsible for reducing the estimate of forest acreage in British Columbia to the seemingly low amount of fifteen millions, considering the common estimate that the province holds 132 million acres of 'forested lands.'

C. P. R.'S HOLDINGS UNTABULATED.

How much of this is permanently alienated? Up to the year 1896 merchantable forest could be bought from the Government at the ordinary rate for

first class land and in this manner certain areas passed into private ownership. Various other timber lands were included among the 8,000,000 acres granted to railway companies in aid of construction. Today, there are in private hands some 870,000 acres, and in the possession of the E. and N. Railway Co., some 375,000 acres, while the Canadian Pacific Railway Company controls a very large area, the acreage of which has not been made public.

Summing up these facts, we find that 15,000,000 acres of 'merchantable timber land' are under the province's jurisdiction, and 11,000,000 additional acres of forest land of unascertained contents are administered by the Dominion Forestry Branch. Of this total of, roughly 26,000,000 acres in the provincial boundaries, there are a little over 1,200,000 acres of timber land under private ownership, not counting the lands held by the C. P. R. Over all the rest, however, the license system prevails and the government is master of the future.

THE CASE IN ONTARIO AND QUEBEC.

In Alberta, Saskatchewan, and Manitoba, of course, all the forest resources are controlled and directed by the Dominion. Ontario, according to Mr. Aubrey White's figures given in 1913, contains an area of 140,000,000 acres of timber; 46,000,000 acres have been surveyed, while 94,000,000 acres have not had a surveyor's line over them yet. Of the 46,000,000 acres only 24 millions have passed (under lease) out of the possession of the Crown. The amount of truly alienated timber land in Ontario is practically nothing. No trace of privately-owned forest area can be found in any of the authorities consulted. While the British Columbia leases run from sixteen to twenty-one years, with twenty-year leases the rule in New Brunswick, the custom in Ontario and Quebec is to give a yearly lease, renewable by custom, year after year. So long as the regulations are lived up to on the part of the lessee the lease is practically perpetual.

In Quebec, which holds the largest forest areas of all the provinces, only six million acres (Hon. Jules Allard's estimate) of forest land are held in private ownership and these are chiefly on the seignories. There is a balance of over 45,000,000 acres of lands under timber leases, and 77,000,000 acres in the possession of the Crown and absolutely available. Therefore, one may fairly say, Quebec has parted title with only six million out of 128 million acres of forest land.

IN THE MARITIME PROVINCES.

New Brunswick and Nova Scotia do not duplicate the conditions found in Ontario and Quebec as regards private ownership. In New Brunswick there are, roughly speaking, four million acres of forest land held in fee simple and eight million acres by the Crown. In Nova Scotia, Dr. Fernow's estimate of the actual green forest area is five million acres and the part which has not been sold outright (mostly in small parcels) is but 1,500,000 acres.

In the Forest Reserves of the Dominion are approximately 17,000,000 acres which are protected against alienation.

On a rough and ready estimate, it would appear that about 14 million acres of forest lands in Canada are held in fee simple and nearly seven-and-a-half millions of this are accounted for by Nova Scotia and New Brunswick.

When one considers that only one-fourth of the forest lands of the United States remain to the credit of the nation, three-fourths having been permanently disposed of and placed beyond effective control, it is plain that our provincial administrations face a responsibility in the perpetuation of our forest riches which our American neighbors look upon with belated envy and amazement.

A Message from Cardinal Begin

ARCHEVECHE DE QUEBEC.

Monsieur Robson Black,
Secrétaire de la Canadian Forestry Association,
Ottawa.

Québec, 17 mai, 1915.

Bien Cher Monsieur,

J'ai toujours suivi avec un vif intérêt le travail de l'Association Forestière du Canada et je constate avec bonheur qu'elle a eu l'excellent effet d'éveiller sérieusement l'attention publique au sujet de nos forêts.

Longtemps on s'est reposé, au Canada, avec une confiance illimitée sur la richesse des régions boisées de notre pays et l'on a semblé croire, sans y trop réfléchir, qu'elle était inépuisable. Mais aujourd'hui que cette richesse est passablement diminuée, il faut bien reconnaître qu'il est grand temps, pour conserver ce qui en reste, de convaincre l'opinion publique de la nécessité qui s'impose de n'exploiter désormais que très méthodiquement nos richesses forestières, de manière que leur rendement ne souffre plus d'aucune diminution.

L'intérêt de cette question forestière, soit au point de vue climatologique, soit au point de vue économique est tel qu'il importe beaucoup que les gouvernements, les associations et les particuliers lui donnent constamment leur attention la plus sérieuse. L'avenir industriel et commercial du Canada, dépend essentiellement de ses ressources naturelles, parmi lesquelles les bois ne sont pas de moindre importance que les mines et les pêcheries. Aussi je fais des voeux bien sincères pour que la "Canadian Forestry Association" reçoive de plus en plus l'adhésion et le concours de toute la population.

Veuillez agréer, cher Monsieur, l'expression de mes sentiments les plus dévoués,

(†) L. N. CARD. BEGIN,
Arch. de Quebec.

ARCHBISHOPRIC OF QUEBEC.

Quebec, May 17th, 1915.

Mr. Robson Black,

Secretary of The Canadian Forestry Association.

Ottawa.

My Dear Sir,

I have always followed with much interest the work of the Canadian Forestry Association, and I notice with great pleasure that it has brought forth the excellent results of awakening seriously public opinion on the subject of our forests.

For a long time in Canada, general opinion placed an unlimited confidence in the richness of the wooded districts of Canada, it being practically supposed that they were inexhaustable. But, now, that this richness has considerably diminished, it must be recognized that it is high time to save what is left, to convince public opinion of the necessity of utilizing only in a methodical manner our forest wealth so that the output does not suffer any more decrease.

The interest of this forestry question, whether from a climatic or economic point of view, is such, that it behoves governments, associations and individuals to give it constantly their most serious attention. The industrial and commercial future of Canada depend essentially on its natural resources, among which the forests are not less important than the mines and fisheries. Therefore I sincerely hope that the Association shall receive more and more the support and adherence of the population.

Kindly accept, dear sir, the expression of my most devoted sentiments.

(†) L. N. CARD. BEGIN,
Archbishop of Quebec.

Mr. W. E. Dexter, student-assistant, attached to the head office staff of the Forestry Branch, is now a lieutenant with A Company, 88th Battalion, encamped at Barriefield.

Mr. J. M. Swaine, entomologist for forest insects of the Entomological Branch of the Department of Agriculture, leaves shortly for British Columbia to continue his investigations.

Two members of the staff of the Forest Products Laboratories have enlisted for overseas service. Assistant Superintendent W. B. Campbell enlisted on May 27th, and Computing Engineer L. L. Brown on May 29th.

Mr. W. J. Boyd, Forest Assistant, attached to the Alberta Inspection Office, has enlisted with the McGill overseas company. Mr. E. S. Davison is now in France serving with the ammunition supply department.

During Chief Forester H. R. MacMillan's absence on a tour of the world in the interests of trade extension as Special Trade Commissioner, Mr. M. A. Grainger is the Acting Chief Forester of the B. C. Forest Service.

Mr. H. R. Christie, Assistant Chief of Operation in British Columbia, is making an extended trip of inspection in the northern forest districts conferring with District Foresters Murray, Bonney, Marvin, Allen and Irwin. He reports that while there was a short spring fire season heavy rains have made the north country safe for the present.

During the winter a number of the District Foresters of British Columbia have given special instruction and practice in cruising, surveying and scaling to their rangers. Such Ranger Schools, as they are called, are held in the field, camps being established in a locality offering opportunities for instruction in all the various lines of work.

The chance to improve their qualifications for forest work given by these "Ranger Schools" has been appreciated by the Rangers and other officers attending them. A number of Forest Guards were, on their urgent request, allowed to attend.

These Ranger Schools will hereafter be held evry winter in each Forest District.

Mr. Wyngard C. Gladwin, an inspector of the British Columbia Forest Branch, died after a long illness on April 13th. Mr. Gladwin was a pioneer in fire protection matters in British Columbia, having had charge of the Provincial fire wardens from the inception of protection work. Formerly a member of the North West Mounted Police, he brought to the work a wide knowledge of men and of the principles of organization and discipline. Mr. Gladwin had succeeded in placing the fire protection work on a sound basis by the time the Forest Branch was established in 1912, and the present system is the natural growth of his work. From 1912 until his death he had charge of the railway fire protection work of the whole Province, acting as inspector both for the Board of Railway Commissioners and the Provincial Forest Branch. Loyal and honourable as an officer, and generous and sympathetic as a friend, Mr. Gladwin's death is deeply felt by his associates.

THE MEN BEHIND THE FORESTS.

Fire rangers in British Columbia ready for the day's programme. The B. C. Forest Service employed 190 regular forest guards last year and 115 extra patrolmen and lookout men for varying periods.

HOW BRITISH COLUMBIA HANDLES SLASH FROM NEW ROAD CONSTRUCTION.

If allowed to lie by the roadside, this heap of slash would probably be responsible for cleaning out the adjacent forest within a very few months.

Gangs employed by the Public Works Department of British Columbia burn the slash in piles, carefully guarding nearby trees from injury. Not only is a menace removed, but the appearance of the road gains immensely.

Problem of the Bark Beetle

By J. M. Swaine, in charge of Forest Insects, Entomological Branch, Department of Agriculture, Ottawa.

Editor's Note.—Readers of the *Canadian Forestry Journal* will find the following article of compelling interest from beginning to end. The bark beetle in the Western forests is an enemy second only to fire in power of destruction and demands immediate and determined attention at the hands of Governments and others responsible for forest preservation.

The injury caused by insects is evident enough nearly everywhere throughout our forests. In the eastern provinces the spruce, tamarac, balsam, poplar and birch have suffered severely from this cause; but the most extensive and destructive forest insect outbreaks of recent years have occurred in the southern and western parts of the Province of British Columbia. In the triangle lying between the Gold Range and the Cascades the yellow pine and the western white pine have been suffering for about eight years from an attack by two species of very destructive bark-beetles, the Western Pine Bark-beetle and the Western White Pine Bark-beetle. Both species of beetles are found attacking and killing the yellow pine in the same locality and even in the same tree, although the Western White Pine Bark-beetle seems to be usually more abundant. The infested area extends from the mountains east of Okanagan Lake westward to Princeton and Nicola, and is still spreading to the west and north. The same trouble in the yellow pine has been reported from the Kootenays, but no extensive infestation is known as yet east of the Gold Range.

The losses in portions of this country have been enormous. In the section infested the longest, apparently about eight years, practically all the pines have been killed and the whole countryside appears as though swept by great fires. In the more recently infested localities the injured timber appears as clumps and streaks of "red tops" with numerous isolated dying or dead trees. Unless the condition of the timber trade will warrant extensive control measures in the near future, the outlook for the yellow pine in British Columbia is very serious indeed.

WHITE PINE WORST SUFFERER.

The western white pine in the same section of country has suffered even more seriously than the yellow pine, but its loss is not so important because of much less extent. The oldest outbreak in the white pine so far discovered is at Sugar Lake, east of Vernon. There the destruction has been in progress for about eight years and a large body of fine timber has been killed. The outbreak was still spreading rapidly when last visited. The Western White Pine Bark-beetle is the species responsible for the death of the trees. It appears to be working everywhere throughout the province where the white pine occurs, and if the present conditions continue, it will apparently kill out the white pine entirely in many sections. The owners of any valuable stands of this timber should be on guard against this most destructive enemy. Its injury is marked by dying trees, isolated or in clumps, with the bark studded with gum-tubes, with the foliage fading to yellow during fall and winter and becoming red by the following July.

The black pine of lodge pole pine, *Pinus murrayana*, is also readily attacked and killed by the Western White Pine beetle; considerable destruction in this timber has been located.

The Douglas fir and western larch are subject to attack by the Douglas fir bark-beetle, but serious outbreaks are not known to occur at present. This beetle usually finds sufficient accommodation in slash and weakened or badly injured trees.

The Englemann spruce and the Sitka spruce are each attacked by a destructive species of bark-beetle, and in several places considerable loss has occurred. The western hemlock and the western balsam also suffer from attacks by several species of destructive bark-beetles. The bark-beetle outbreaks in the forests of British Columbia are fast becoming a very serious problem.

OUTBREAKS CAN BE CONTROLLED.

Fortunately, outbreaks of injurious bark-beetles can be controlled, if not neglected too long, and usually without great expense. The habits of the beetles are such that it is

Inner face of bark from a dying Bull Pine at Princeton, B.C., showing tunnels of the beetles which have killed the tree.—1. Egg-tunnels of the Red Turpentine Bark-beetle.—2. Larval-chambers of the same, excavated by the young larvae working in congress.—3. Egg-tunnels of the Western Pine Bark-beetle, showing egg-niches, and a few larval-tunnels. The boring-dust has been largely removed.

possible to kill off such a large proportion of their numbers by modifications of the logging methods that the remainder will be largely satisfied to breed in the slash and broken trees without attacking the green timber.

The appearance and habits of the various species, while differing often in very important details have many points in common. The more injurious species are small, stout, usually reddish-brown or pitch-coloured beetles with hard wing-covers, varying in length from less than one-eighth to about one-third of an inch. The young are small, legless, whitish grubs with powerful jaws, found working in the inner bark or between the bark and the wood of the infested trunks.

The winter is usually passed by the adult beetles and their grubs in or beneath the bark of trees attacked the preceding summer. In the late spring or early summer the mature beetles leave the old bark and enter the bark of the trunks and branches of diseased, dying, or healthy trees in immense numbers. We have found as many as 2,000 pairs of beetles entering the lower fifty feet of the trunk of an infested yellow pine. Each pair of beetles cut an entrance-tunnel through the bark to the surface of the wood and continue this as an egg-tunnel along the wood-surface, scoring both inner bark and sap-wood. These egg-tunnels may be vertical, transverse or irregularly winding. The effect, in any case, when green timber is entered, is to check the sap flow in proportion to the number of beetles uniting in the attack upon the tree. In the case of green pine and spruce, the cutting of the entrance tunnels and egg-tunnels always results in a flow of resin which hardens about the entrance-hole and drops on the bark below as masses of gum. These gum-tubes on the bark of green trees usually indicate an attack of destructive beetles and should lead always to a close investigation. The female beetle deposits her eggs in elongate masses, or in niches, along the sides of the egg-tunnel. The grubs hatch in a week or so and bore singly or in congress in the inner layers of bark or usually between the bark and wood. These larval mines when regular, as they are in many species, form rather handsome bits of carving; but whether regular or irregular they very effectively destroy the inner bark and stop the flow of sap through the portion attacked. If they entirely girdle the tree, the latter dies in a few months, usually becoming yellow before spring and a "red-top" by the following July. The grubs mature to the adult beetles in the ends of their mines, either between the bark and the wood or, more rarely, deep within the middle layers of the bark. Early in the following season the young beetles leave the infested trees, then "red-tops," and attack fresh trees. With some species the old beetles also emerge very early and produce another brood. With many species there is, as indicated in the outline just given, but one brood each season, or one and a partial second brood, through some of the young beetles emerging in the fall; but other species have regularly two broods each summer. The variations in climatic conditions have a marked influence upon the rapidity of development.

All our British Columbia species normally prefer weakened or dying trees or slash for breeding purposes; but the more destructive species will readily attack and kill healthy timber when they have had opportunity to breed to immense numbers.

SLASH BURNING AS A REMEDY.

In the brief account of their general habits just given we have suggested two important methods of control. The less destructive species, such as the Douglas Fir Beetle and the Sitka Spruce Beetle, with their strong preference for dying bark, will breed for a considerable time in the slash while the cutting continues; and nearly all the beetles of the neighbourhood of the species involved will be found in the bark of the summer's or previous winter's slash during the winter. It is therefore evident that if the slash is burned at any time between November and May the vast majority of the broods will be destroyed. Those that escape will usually find abundant breeding material in the normal crop of slash and broken or injured trees. Systematically burning the slash during the time between fall and spring is a very efficient method of control for most of our bark-beetle species.

The second method has reference to the control of outbreaks in standing timber. Inasmuch as the beetles are to be found, in this case, during the fall, winter and spring, in the bark of the trees attacked the previous summer, it is evident that if we can log the majority of those infested trees during that period and so handle the logs as to destroy the broods contained in the bark, we can hope to reduce the numbers of the beetles to such a degree that they will thenceforth find sufficient breeding material in slash and not molest the green standing timber. Extensive control operations carried on in the Western States by the U. S. Bureau of Entomology have demonstrated that if 75 per cent. or even a lesser percentage of the infested trees can be so removed and treated the outbreak can be effectively checked.

When it becomes necessary to undertake direct control measures, the broods in the bark of the infested trees can be destroyed by whichever of the following methods are best suited to local conditions:

Floating the logs.—Where water is available, the simplest method is to cut during winter and float the infested logs as soon as cut or as early in spring as possible. This will kill the greater part of the broods.

Sawing during winter and burning the slabs.—Where it can be done profitably, the infested logs may be sawn during winter, and the slabs, which will contain the brood, burnt before spring opens.

Barking the trees.—It is always possible to fell and bark the infested trees during winter. The simple removal of the bark effectively kills the broods of the species whose grubs work in the inner layers of bark, between the bark and the wood surface. The presence of the greater number of the grubs in the middle layers of bark renders burning the bark necessary in the control of the outbreaks involving the Western Pine Bark-beetle. Control operations must be completed during the period between the first of November and the following June; but should be finished as early in spring as possible.

When it is not possible to utilize the timber profitably, and control measures are necessary to protect valuable holdings against ravages of the beetles, the infested trees should be treated by the cheapest effective method so as to destroy the contained brood. The infested trees may be cut and burnt before spring opens, frequently at less expense than by removing and burning the bark. By means of a special barking tool, the bark may be removed from a sufficient number of the standing infested trees to effect partial control.

CO-OPERATION A NECESSITY.

This control work has reference solely to the freshly-infested trees, with green, yellowish, or moderately reddened foliage, having the bark filled with the beetles and their grubs, and not to the old "red-tops" which have been dead for from one and a half to several years and from which the beetles have emerged. Beetle-infested trees with normal foliage are detected readily by the gum-tubes upon the bark. Further details are given in Entomological Bulletin No. 7 of the Division of Entomology, Experimental Farms, obtained free of charge from the Chief of the Publications Branch, Department of Agriculture, Ottawa, Ont.

It is hoped that as soon as the lumber trade of the west resumes its normal condition control measures will be undertaken to check the wholesale destruction of timber that is now in progress in many places. In the meantime the Entomological Branch is endeavouring to have investigations of the various outbreaks completed so that effective and practical methods of control can be recommended, in all cases, when the time for their application arrives. The co-operation of all interested in the forests to aid in locating and delimiting the outbreaks is earnestly requested.

The Western Pine Bark-beetle. (*Dendroctonus brevicomis* Lec.) Greatly enlarged.

Survey Exploration Party in Brazeau Forest, Rocky Mountains.

SEVEN SURVEY PARTIES OPERATING IN WEST

Seven surveys are in the field this summer under direction of the Forestry Branch. The purpose of these surveys is to estimate the timber resources of the Reserves and to explore outlying areas with a view to determining the quantity and location of non-agricultural lands together with their assets in standing timber. The work is absolutely essential as the corner stone of a forest policy, supplying the information by which action may be gauged. The districts covered by the survey parties and the names of those in charge are as follows:

Central Manitoba—C. E. Maimann, New Brunswick Forest School, in charge, assisted by L. S. Webb.

Eastern Manitoba—J. D. Aiken, Toronto Forest School, in charge, assisted by H. A. Porteous.

Makwa River, Sask.—A. V. Gilbert, Toronto Forest School, in charge, assisted by G. B. Gill.

Montreal Lake, Sask.—G. M. Dallyn, Toronto Forest School, in charge, assisted by G. A. Malloy.

Lake Labiche, Alberta — O. G. Horncastle, New Brunswick Forest School, in charge, assisted by R. D. Jago.

Peace River, Alberta—Forest Assistant J. A. Doucet, in charge, assisted by R. D. Macdonald.

Traverse Survey, Clearwater Forest Reserve—A. Gorman, C.E., in charge, assisted by R. L. Snow.

FROM COAST TO COAST

G.T.P. TO USE OIL ENGINES.

Announcement is made by the Grand Trunk Pacific that contracts have been let and other arrangements made for the installation of crude oil burners on passenger locomotives on the section between Prince Rupert, B.C., and Jasper, Alberta, a distance of 718 miles. The installation will probably be complete next June. Freight engines will continue to use coal.

LOWER OTTAWA'S GOOD WORK.

Energetic efforts by Mr. A. H. Graham, Manager of the Lower Ottawa Forest Protective Association, have resulted during the month of May in the erection of a 42-foot lookout tower and a ranger camp on Devil's Mountain in the township of Robertson. Telephone lines were constructed to the extent of 5½ miles and connect with the Lievre Telephone Company, which in turn meets the Bell at Buckingham. This will give the manager quick connection from his Ottawa office with the lookout tower, and will also link the rangers together in an effective way.

The tower is built on the highest peak of Devil's Mountain and furnishes one of the most commanding positions in the Laurentians, overlooking the watersheds of the Gatineau and Lievre rivers.

"TODAY."

A poem of cheer, so good that it has been credited to various English and American authors, has at last been traced to its rightful author, Douglas Malloch, Assistant-Editor of "The American Lumberman" of Chicago.

Sure, this world is full of trouble—
I ain't said it ain't.
Lord! I've had enough an' double
Reason for complaint.
Rain an' storm have come to fret me,
Skies were often gray;
Thorns an' brambles have beset me
On the road—but say,
Ain't it fine today!
What's the use of always weepin',
Makin' trouble last?
What's the use of always keepin'
Thinkin' of the past?
Each must have his tribulation,
Water with his wine,
Life it ain't no celebration,
Trouble? I've had mine—
But today is fine.
It's today that I am livin',
Not a month ago,
Havin' losin', takin', givin',
As time wills it so.
Yesterday a cloud of sorrow
Fell across the way;
It may rain again tomorrow,
It may rain—but, say,
Ain't it fine today!

THE COVER PICTURE.

The scene illustrated on the *Journal* cover this month is at Openicon Falls, Temiskaming Lake, Quebec, along the lines of the Canadian Pacific Railway, to which company we are indebted for the photograph.

SPRUCE WORM BUSY.

The spruce bud worm worked serious damage through sections of New Brunswick last summer, as is made clear by recent reports. The new growth over considerable areas of the St. John river and Miramichi valleys was practically destroyed.

C.N.R. ADOPTS PATROL.

Extensive plans have been made to protect the forests along the Canadian Northern right of way between North Bay and Port Arthur in accordance with the regulations of the Board of Railway Commissioners. Twenty-three special patrolmen with track velocipedes will be set at work, together with two head patrolmen with power speeders covering those parts of the line where the fire hazard is greatest. Section men and other employees will also be called upon to cooperate where necessary.

DEBRIS BURNING PAYS.

The good results of destroying inflammable material and thereby minimizing the fire risk has been proved by the New Brunswick Railway Company. Last summer this company cleaned up a strip of timber bordering the rights-of-way of the National Transcontinental and Intercolonial railways. The consequence was that fires were confined to an area of less than one hundred acres. Very little of what was burned originated from the railroads. The debris was piled on the right-of-way and burned there.

TO PLANT MILLION TREES.

The tree planting operations of the Laurentide Company of Grand Mere, Quebec, have attained such success as to attract national attention. The far-seeing policy of this company is attested by the programme laid out for many years to come. By planting up lands bought for the flowage rights, 150,000 trees, mostly Norway spruce, were planted in 1914 and have wintered exceptionally well. Two hundred thousand more will be planted this spring and two to three hundred thousand in the fall. As soon as possible 1,000,000 trees per annum will be planted, thereby equalling the company's present annual cut. An extention of one and one-half acres is being made to the company's nursery in which some experiments in raising trees will be carried out.

Much interest has been directed towards the reindeer herd imported by the company last summer. The animals have wintered well. Two bucks were trained to harness and with satisfactory results.

Making a Fire Proof Forest

By R. H. Campbell.

The expression "Fire Proof Forest" may strike one as a rather strange phrase in view of the yearly destruction of the forests throughout Canada by fire, but the point must be reached at some time when the forests shall be practically fire proof, and that this is not an impossible ideal is proved absolutely by experience in many districts in Europe. The problem may be clearer to the ordinary citizen by comparison with fire prevention in the cities and towns.

Municipal regulations provide for the use of fire proof material in the construction of buildings in crowded districts and thus one cause of the spread of fire is greatly diminished, but this is a method which it is impossible to apply to the forest. No kind of trees but wooden ones can be grown.

Education goes far to make a city fire proof. The man who carelessly throws away a lighted match or cigar stub is a menace to a city in the same way that he is a menace to the forest. The man who leaves inflammable material lying about in piles and in places where fire is likely to fall among it is the cause of many a fire in the city as well as in the forest. The man who lights a fire and leaves it to its own sweet will is a danger to the forest no less than to the city. Education against carelessness with fire will stop the fire before it starts.

Every modern city has its system of call boxes located at strategic points throughout the city from which notice can immediately be sent to the central station of the occurrence of any fire, and in addition to this telephone wires all over the city afford an opportunity to send in warning from almost every house. Fires make little headway before notice is given. Stop the fire at the start must be the motto. In the forest the only way of ensuring safety is to follow a similar method as fully as possible. All forest fire organizations which are really attacking the problem in a serious way are building telephone lines which communicate with the central fire ranger station. Inasmuch as the population of the forest is not as a rule very numerous or well distributed to observe fire, it is also necessary that the fire guardians should have elevated points of vantage from which they can have an outlook over a considerable area of forest and watch for the light columns of smoke that give quick evidence of any fire being started.

Having information of the fire is however only the first stage. In every city a permanent fire fighting organization is established and the services of these men are available at any moment to go immediately to any fire. Trained in the fighting of fire and the use of apparatus in connection therewith and physically and mentally fit for the great strain which fire fighting puts on the physical powers and on the morale of men, the character of men of the fire fighting organization has a great deal to do in making a city fire proof. And in no less degree is the character of the men who have to handle the fighting of fires in the forest one of the factors that make for the safety of the forest. The fire ranging staff of any forest must be well selected; the men must be capable and efficient.

But even with due notice of fire and a good fire fighting crew there would be serious difficulty in every city in handling the fire situation if all the streets across a city were blocked so that the fire fighters would have to take a long detour through the suburbs in order to come around to a

fire which was within a very short distance of them originally. This is the situation however that at the present time faces the fire fighters in the forests at every point. Neither roads nor trails are opened up through great extents of the forest, and passage is almost impossible. Fire is within a very short distance of the fire fighting force and they are compelled to take a detour which will mean the loss of hours and possibly days, or else consume the same time in cutting out a new road or trail, with the result that when they arrive at the fire it has got beyond control altogether. Fire and war must be largely fought before they occur.

When the fire brigade of a city arrives at a fire it has with it the equipment necessary for extinguishing the fire. In these modern days in the cities this equipment has become very elaborate in its nature. In the forest there is the same necessity but owing to difficulties of transport, water supply, etc., it is not possible to handle fires with similar equipment. The shovel, the ax, the hoe, the canvas water bucket, are the great standbys in fighting fire. Chemical extinguishers and portable pumps are used to a certain extent but their use is necessarily limited. Equipment sufficient and conveniently placed in the forest must be ready.

These methods followed out thoroughly will make the forest fire proof. Until they are the case is hopeless.

FOREST MANAGEMENT IN DOMINION PARKS

BY

By A. Knechtel, Chief Forester of Dominion Parks.

To produce timber for the sawmill is not the chief purpose of forest management in the Dominion Parks. Its purpose is to protect and improve the forests that they may perpetually clothe the hills and valleys with beauty; that they may give health and pleasure to the persons who visit them, and that they may protect the game and the fish that inhabit them.

In park administration many trees are left standing which would be cut down if the forest were managed for market purposes. Thus in Stanley Park at Vancouver certain trees are treasured on account of their large size. Even an old dead stub is carefully preserved as it measures about sixty feet in circumference at the base. Another tree is highly prized because it is covered with knots along its entire trunk. In the commercial forest such trees are undesirable as they occupy ground that might be occupied by young thrifty trees.

Forestry for commercial purposes turns all mature trees into lumber; but in park forests large portions of the primitive woods should be left standing. They have an interest attaching to them because they show the condition of the forest before the advent of the white man, and because they have a vegetation of their own in mixture of species, shrubbery, flowers, ferns and mosses. And they have a characteristic fringe of twigs and foliage that are lacking in the cultivated forest.

Trees planted for commercial purposes are selected on account of the quantity of wood which they will produce of the qualities desired by the mills. Two or three species usually serve such purpose better than a larger number. No heed is given to variety for aesthetic reasons. The planting is done simply for a wood crop. But in planting for park pur-

[Photo by A. Knechtel.

One of the most beautiful scenes in America. Looking down the valley of the Bow River from a gallery of the C.P.R. hotel at Banff.

poses the trees are selected on account of beautiful foliage, graceful form, color of bark, ability of the roots to hold the soil in place on steep slopes, vitality to live in exposed situations, or for other attractive or inherent characters. Great variety of species is desirable in such planting, whether the trees are good for sawmill purposes or not. Thus, in the parks of Europe, along roadways, and also distributed through the woods, are several species of American trees, planted for no other reason than that the foliage turns a beautiful color in autumn. Long avenues are planted with birch trees on account of the striking white color of the trunks.

For market purposes trees are planted close together, about four or five feet apart. Such crowding deprives the trees of their limbs and causes them to grow timber of good quality. But in park planting the chief object is to cover the ground with verdure and the limbs give the tree its charm. The trees may, therefore, be placed farther apart.

WHERE SCENERY COUNTS.

Many areas in a Dominion Park such as hill-tops and steep slopes might, from a scenic point of view, be profitably reforested, where, from a commercial standpoint, it would be folly to reforest as the trees, though they might grow large enough for aesthetic purposes, might not grow to timber size, and even if they did the timber might be difficult to get to the sawmill.

Reforestation for commercial purposes crowds out every kind of vegetation excepting a very few species of timber trees; but it is very essential for parks purposes that other species and shrubbery and large flower areas and even grassy spots should be preserved.

In a commercial forest the roads are located with a view to getting

the timber to market conveniently and easily. Hence they are usually placed in the valleys. The Act by which the Dominion Parks were established requires that they shall be maintained and made use of as pleasure grounds and the management of the forest must constantly keep this requirement in view. Roads through such a forest, therefore, should not be logging roads, except incidentally, but should be such as to give beautiful views, and hence should usually be located at higher elevations than the roads in commercial forests.

SAWMILLS DEBARRED.

In the commercial forests sawmills are numerous, but with every added sawmill is added fire danger, and this menace is too great to be permitted freely in a Dominion Park, where the great natural beauties once destroyed may not be restored in a thousand years. In a commercial forest wherever there is any considerable area of mature timber, a sawmill should be there putting it into lumber. Not so in a park, where it is desirable that large areas of mature woods should be retained.

It does not follow, however, that no timber should be taken from the Dominion parks, and as a matter of fact considerable quantities are removed yearly. Trees die from natural causes and fires occur which kill them. The dead timber is unsightly and is a menace to the parks. It should be placed upon the market at a price to encourage its removal.

It is necessary in a Dominion park to remove also some green timber. Where the forest grows in crowded condition, the removal of some trees benefits those remaining as they then get more food and more light and improve in growth, in form and in foliage. Green timber should not be taen, however, with a view to satisfy a market, but solely to improve the park, and the trees taken should be previously marked by a park official who can appreciate the importance of each tree for park purposes.

[Photo by A. Knechtel.

A Warden's Cabin in Rocky Mountain Park. The Warden is directly responsible for fire protection.

Fire Protection On Railways

Canadian Companies recognise the economy of preventive systems and co-operate with the Railway Board

One of the most cheering evidences of the general awakening of Canadians to the folly of forest destruction has been the co-operation of the Canadian railway companies in the regulative work of the Board of Railway Commissioners.

The newness of the Board's orders respecting forest fires a few years back gave them, not unnaturally, an appearance of unreasonableness and interference. As time passed and the corporation executives perceived the identity of burned forests and disappearing freight traffic, the grudging obedience to the various orders came to be tinged with more and more goodwill. Today, the railway companies are manifesting a readiness to comply with the fire protection requirements, which greatly assists the Chief Fire Inspector and his staff and results in appreciably improved conditions along the rights-of-way.

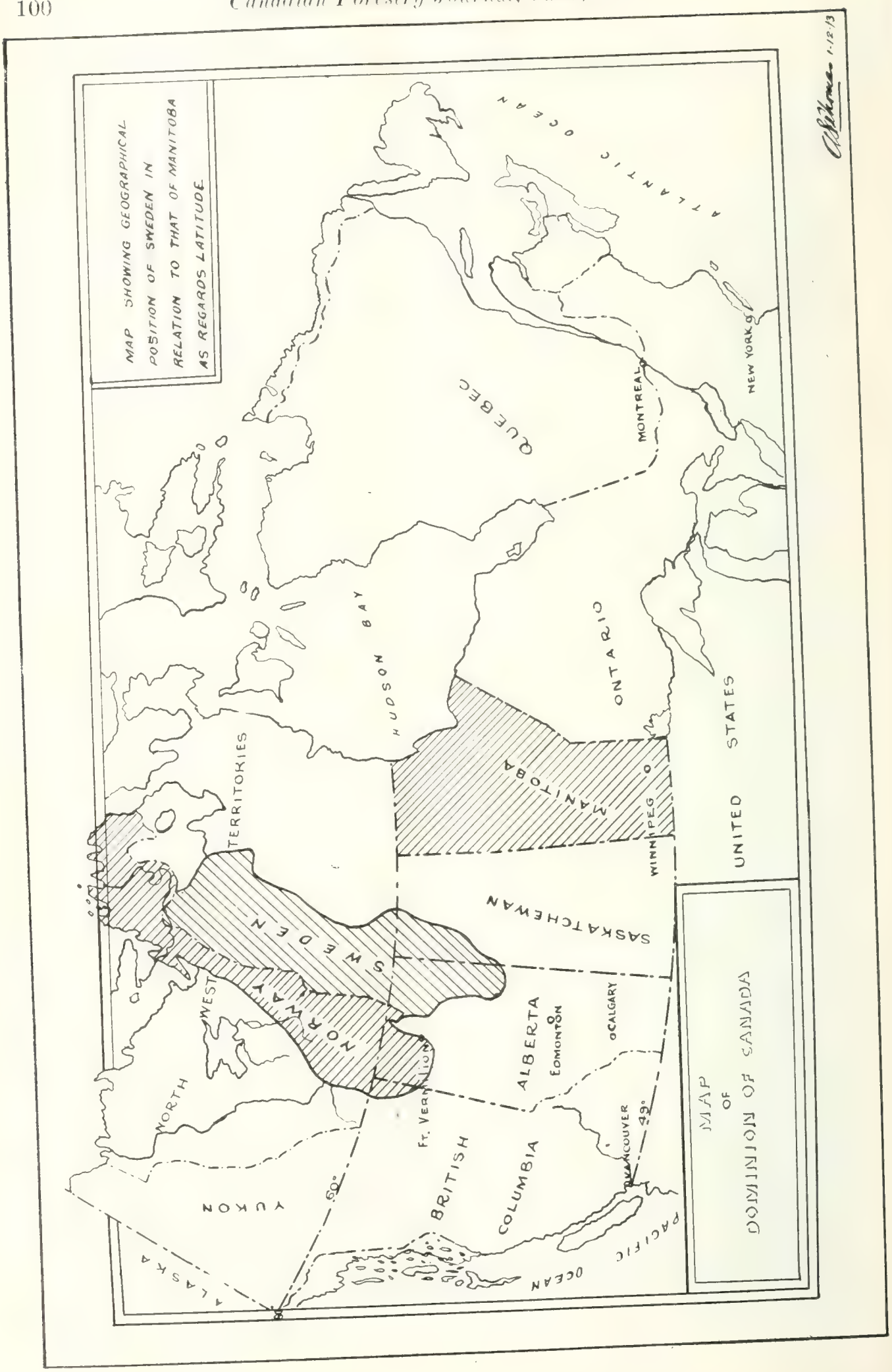
The orders for 1915 were sent out on March 16 and came into effect on April 1, covering a period to November 1. All roads (except Government roads) under construction or being operated by steam are obliged to accept the Commission's regulations. The ash pans and smoke stacks must be protected and regular inspection is provided to see that this is carried out. Provision is made for keeping the rights-of-way in a condition which will reduce to a minimum the occurrence and spread of fire. This is attained by means of the disposal of debris and litter and the ploughing or digging of fire guards where considered necessary. Conductors, engineers and trainmen are required to be vigilant in regard to fire outbreaks and prompt in reporting them to the nearest railway employees and the superintendent. The railways are made responsible for fires occurring within 300 feet of the railway track, unless proof is furnished that such fires were not caused by the railway.

The use of a special fire patrol, assigned to the single task and well equipped with velocipedes and speeders and fire-fighting equipment is, of course, many times more effective than even the most conscientious and obedient efforts of regular railway employees. As to how each railway shall detail its patrolmen and equipment, the Chief Fire Inspector, Mr. Clyde Leavitt, specifies the extent and character of patrol in the various sections of the systems under his care.

Velocipede and power speeder patrolmen passing telegraph stations are reported the same as passing trains and such records are open to the Board's inspectors. Where there are no regular stations, provision is made for a point of register near each end of the beat.

Each foot patrolman is equipped with a shovel and canvas bucket. Each velocipede and power speeder patrolman has two shovels, two canvas buckets and an axe, in addition to which a quantity of fighting equipment is stored at the section tool house for emergencies.

The Board has been careful in formulating the rules to impose the minimum of expense upon the companies. A point much emphasized is that while the rules provide for an average patrol, the vigilance of an individual must be supplemented by the ability to summon plenty of assistance, with little delay. The companies have been quick to see the importance of making the work of the patrolman effective by instructing their employees to be prompt with assistance in case they are called upon. Transportation on the companies' lines is freely granted to bodies of fire fighters moving from point to point.


MAP SHOWING GEOGRAPHICAL POSITION OF SWEDEN IN RELATION TO THAT OF MANITOBA AS REGARDS LATITUDE
ATLANTIC OCEAN
QUEBEC
MONTREAL
NEW YORK
HUDSON BAY
ONTARIO
MANITOBA
WINNIPEG
UNITED STATES
TERRITORIES
SWEDEN
NORWAY
SASKATCHEWAN
WEST
NORTH
ALBERTA
EDMONTON
CALGARY
Ft. VERMILION
BRITISH COLUMBIA
VANCOUVER
49°
60°
YUKON
ALASKA
PACIFIC OCEAN
MAP OF DOMINION OF CANADA

Sweden's Lesson for Manitoba

That Manitoba is destined some day to produce enormous quantities of timber, creating hundreds of new industries and advancing the prosperity of the Province and Dominion has long been the belief of practical foresters. There is no conflict in this belief with the cause of agriculture. The forest engineer is laying no weird plot to extinguish wheat and stock raising with stands of timber. All he seeks is to turn the forest areas to the highest account, to compel them to produce revenues to the people of Manitoba ten or twenty times in excess of the present sums, and to hitch the same intelligence to forest management that now distinguishes the farmer and his oat field. Although most of us have thought of Manitoba as a 'prairie province' given over to field crops, it has always had a considerable area of forest and by the recent extensions of the boundaries large territories have been added which are almost entirely forested land.

MANITOBA AND SWEDEN.

Can these valuable sources of supply for the world-wide commerce in wood manufactures be turned to such account as to duplicate some day the returns from agriculture? Why not? asked Mr. R. H. Campbell, Dominion Director of Forestry, and he proceeded to draw a striking comparison with Sweden, a northern country with similar conditions of soil and climate. While the population of Sweden (5,600,000) is more than ten times that of Manitoba, the total area of the latter is 77,000 square miles greater, with a land area exceeding that of Sweden by 47,000,000 acres.

In 1911, Manitoba's 103 mills accounted for a lumber cut of 8,957,500 cubic feet. The number of Swedish wood-working industries, by the last statistics, is 1,528, and the timber output 1,020,000,000 cubic feet; the mills afford employment to 56,424 people. Against Manitoba's 2,415,000 acres of forest reserves, directed by the Dominion Forestry Branch, Sweden's government reserves are 21,200,000 acres (90 per cent of which is forested) and the net revenue therefrom is $2,122,625. A staff of 971 men is employed, of whom 230 are technically trained.

HEAVY EXPENDITURES REQUIRED.

"Sweden has probably the advantage of Manitoba in having better drainage in some of the northern areas and in having a more extended sea-coast, with quicker and cheaper access to long established markets, but I cannot see that other conditions exist that give Sweden an advantage over Manitoba if the forest areas were in as good condition. This they are not at present, nor will they be for a long time to come, and it will require a large expenditure on protection and improvements without regard to revenue during that time, to bring the forests into good condition and to produce a revenue that will more than offset the expenditure. Under the administration of the federal government the forests have been allowed to get into such an unsatisfactory condition and the federal government should make the necessary expenditure from its large revenues to place such a great natural resource, and so important to the prosperity of the province and of the whole country in a condition of permanent security and producing power so that it may regularly and continuously produce a supply for the domestic needs of the population, a revenue for the State and the raw materials for industries.

"The investigations we have made of the rate of growth of timber in the province of Manitoba compare favourably with the rates of growth in European countries, such as Germany, France and Sweden, where forestry is being practised profitably. The rotation, or the period required for maturing a crop of trees from seed, in Germany is with spruce and pine from 60 to 80 years. In Sweden the rotation is 60 to 80 years for pulpwood and 100 to 120 years for lumber. The investigations of rates of growth of spruce and pine so far as they have been carried out here indicate that on ordinary well drained soil the period of rotation might be within simliar limits."

Forest Research Leaders to Cooperate

In order to bring together the individuals and organizations interested in forest research in Canada and to economize effort and facilitate progress, Mr. R. H. Campbell, Dominion Director of Forestry, has formed an advisory committee in connection with the Branch. The members will be called upon from time to time to suggest problems for investigation, to pass upon all projects planned and to revise information regarding results for publication. Communication will be mainly confined t, correspondence, as frequent and general meetings would not be possible. No remuneration is attached to the work. The following have been invited to become members:

Dr. B. E. Fernow, Dean, University of Toronto Forestry School; to represent forest management and silvicultural aspect of forest research.

Clyde Leavitt, Forester; to represent Conservation Commission and forest protection researches.

W. N. Millar, Assistant Professor of Forestry, University of Toronto Forest School; to represent forest mensuration and engineering aspects of forest research.

R. B. Miller, Dean, University of New Brunswick Forest School; to represent Maritime Provinces.

Ellwood Wilson, Forester Laurentide Company; to represent Quebec private timber owners.

G. C. Piché, Forester Province of Quebec; to represent Quebec Provincial Government.

E. J. Zavitz, Forester, Province of Ontario; to represent Ontario Provincial Government.

H. R. MacMillan, Forester, British Columbia; to represent British Columbia Provincial Government.

L. M. Ellis, Forester, Canadian Pacific Railway; to represent Canadian Railways.

Dr. Judson F. Clark, Clark & Lyford, Consulting Foresters; to represent Private Foresters, both east and west.

Dr. H. M. Speechly, President, Manitoba Horticultural and Forestry Association, to represent farm forestry in prairie provinces.

J. H. White, Instructor, University of Toronto Forest School; to represent technological and botanical aspects of forest research.

Dr. C. D. Howe, Associate Professor, University of Toronto Forest School; to represent silvical aspects of forest research.

THE UNPOPULAR POPLAR.

Editor, *Canadian Forestry Journal*:

With the statement of Mr. R. C. Tefft, Hudson Falls, N.Y., regarding the uselessness of poplar, which was contained in the last issue of the *Journal,* I heartily concur. A considerable experience in Eastern Canada satisfies me that poplar should be regarded as a weed and killed out wherever possible. The only legitimate use I have ever seen for it is in mixing with spruce for the finer grades of magazine paper. In Western Canada, I admit that poplar may sometimes be called a 'farmer's tree' for the reason that nothing better may be at hand and the rate of growth of the poplar is, of course, very pleasing to the man who is in a hurry.

J. V. C.

Toronto, Ont., June 1.

The forest wealth of Quebec province is placed at $600,000,000, of which white and red pine represent $200,000,000, spruce and balsam $250,000,000, other pulpwood $100,000,000, hardwoods $25,000,000, and cedar $25,000,000.

PINE PLANTING ON THE NORFOLK SAND PLAINS.

The seedlings shown in the picture were transplanted from the Government nurseries and are not only establishing the species in a district where the pine once attained large dimensions, but are holding the sand from blowing.

Experience in Pine Planting

Many small plantations under cultivation. Nursery stock able to withstand conditions in open

In several parts of Eastern Canada at the present time, private experiments in the planting of white pine spruce and other seedlings are being conducted. In some of these experiments the seedlings have been transferred direct from the forest to their permanent location and the results have given, so far as reported, only indifferent satisfaction.

Experience has shown that pine or other seedlings are the better for nurturing one year or more in the nursery row, the transplanting having the effect of bunching the roots together thereby equipping the plant to meet the test of harsher conditions. The pine seedlings taken from the Norfolk County nurseries and placed on absolute sand land have done exceedingly well. It has been found, however, that in most cases the young seedlings taken direct from the shelter and moisture of the forest will not readily adapt themselves to a sandy field possessing no shelter and devoid of other nurturing factors.

The *Canadian Forestry Journal* is in receipt of a statement by a Pennsylvanian much interested in forest reproduction. Some years ago he tried planting a number of evergreen species (white pine, hemlock, white spruce, Canada balsam, Frazer's fir) on slopes already timbered with deciduous trees. With the exception of the hemlock (a shade enduring species) the result was disappointing. Most of the trees planted in the open survived, but those placed under other trees fared badly. In 1902, he purchased 2,000 white pines from a nursery in Illinois and planted them in an open school garden. They re-

sponded vigorously until the following spring when they were transplanted to a sod pasture on a northwestern slope. The little trees adapted themselves quickly to their new circumstances and the total loss since the original purchase of the two-thousand was two hundred. Two years later, 7,000 additional pines were placed directly in their permanent positions without being nurtured for one season in the nursery row. Most of the seedlings died and have been twice replaced.

This and other practical experiences would indicate that seedlings have to be carefully handled for a year in nursery rows before they will accept the conditions of the open sandy field as a permanent location.

WORTHY EXAMPLE SET BY LATE MR. J. C. BROWNE.

Death this year has taken a heavy toll of the friends of forest conservation and it is with deep regret that we chronicle the passing away on April 10 at his residence in Ottawa of Mr. J. C. Browne, who for some years past had been connected with the firm of Fraser & Co. Mr. Browne was one of those men who have made the Anglo-Saxon race what it is. Modest, capable, courageous and of sterling integrity he never advertised himself, but on the other hand once men got to know him they never failed to appreciate his worth. Born in the old city of Quebec in 1847 he began his business life with the Union Forwarding Company and later became a lumber broker and in this way was brought into touch with Ottawa lumber firms, which connection brought him to Ottawa in 1899. After the great fire of 1900 Mr. Browne was administrator and treasurer of the Ottawa Fire Relief Fund and it is significant that his last public work was as administrator of the Ottawa branch of the Canadian Patriotic Fund. It is not necessary here to speak of Mr. Browne's business life which is well known throughout this part of Canada, but it may be pointed out that he was one of the warmest friends of the Canadian Forestry Association and a sincere believer in forest conservation. He did his part in the fight against forest fires, and did it optimistically, holding that fires which rightly caused public apprehension and indignation today would have passed, and did pass, unnoticed thirty years ago. He was also an advocate of the training of our Indians as fire-fighters and practised this, so far as possible, on limits under his charge. His reasonableness, his willingness to hear the other side, made him a dangerous man to those who advocated fake schemes or foolish theories because he did not browbeat them into further obstinacy but persuaded them of the better way. The cause of forest conservation is the poorer for his going and our hope is that his example may lead younger men to step into his place.

"ELEMENTS OF FORESTRY."

"Elements of Forestry," by Frederick Franklin Moon, M.F., Professor of Forest Engineering at the New York State College of Forestry, and Nelson Courtlandt Brown, M.F., Professor of Forest Utilization at the same institution, is a handsomely printed and bound work of nearly four hundred pages designed to act as a textbook, broad in its scope and containing general information on all phases of the subject. That the book well fulfills the objects of its authors is clearly evident. The presentation is singularly lucid and thorough, so much so that any adult reader may by conscientious perusal place himself in intelligent touch with the science and practice of forestry. The book has been planned to make the study of forestry as interesting as possible by means of excellent illustrations and a cleverly graduated arrangement of the instruction. It is published through the Renouf Publishing Company of Montreal.

There are seven spruces in the United States. Four are confined to the west; two to the east; while one, white spruce, has a continent-wide distribution.

INSURANCE OF TIMBER LIMITS

One of the questions in connection with forest management which comes up occasionally as a matter of argument, rather than prophecy, is the possibility of developing fire protection to a point where insurance on a limit will be issued by commercial companies. At present no such thing is even in sight, and discussion may seem premature and useless. Were the timber limit brought within the class of reasonable risks,—and such a thing is at least 'possible',—insurance in some form, assumed by mutual associations, companies, or governments, might prove as simple as the covering of cargoes and hulls at sea. The *Journal* recently asked the opinion of a consulting forester of national reputation upon the problem of forest insurance, and his reply was given in these words:

"It is my personal judgment that the risk of loss by fire on timber limits is one that must necessarily be borne by the owner. As I see it, the only exception to this would be the case of very large tracts, in which case insurance might be secured against a great catastrophe, the owner carrying the risk of all loss up to a certain point, in a similar manner as in the insurance policy negotiated by Price Bros. of Quebec.

"It goes without saying, of course, that in any case the company issuing a policy would only do so after the tract had been reported upon by experts for the purpose of determining the cost of the risk.

"No system of government fire patrol, however efficient, could eliminate the necessity of a special patrol for each tract, for, in any case the risk, and therefore the cost of the insurance, would vary greatly from tract to tract—and vary vastly."

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Canadian Forestry Association,
Journal Building, Ottawa.

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THE FAKE SETTLER AT WORK

The fake settler is of many species but in every instance meets the definition of a nuisance and a trespasser. Both Ontario and Quebec possess laws on their statute books, and have put them to good account, debarring new settlers from non-agricultural lands. That is, all new areas opened up for settlement are supposed to pass first under the scrutiny of an expert in soil values. Those parts of a township which promise to grow trees alone are, by law, fenced off as forest. The purpose of these laws is in every sense praiseworthy. They seek to protect not only the settler but the soil and to preclude all future opportunity of repeating the tragedy of the sand plains in Norfolk and elsewhere.

It would appear, however, from representations made recently to the *Canadian Forestry Journal*, that the riddance of the old and costly custom in Quebec is not quite complete. Information received refers particularly to the disposal of 'homesteads' along the edge of one or more timber limits. It is asserted that the soil was reported upon adversely by experts and that any observer of commonly good judgment would discard the lots from any agricultural classification. Additional proof that the 'settlers' were seeking cheap timber and not land is the fact that nearby lots, partially bare of wood growth, were not asked for by the applicant 'farmers', who seemed to prefer the prospect of 'hewing out a home' from a bunch of twenty-inch pine.

No one can justify this practice of handing over chunks of somebody's timber limit to those who have little notion of planting field crops or developing live stock after the valuable timber is cleared off. This sort of settler is in reality a speculator, getting his timber for practically nothing and moving along to the next picnic ground when the wood crop is removed.

His tenure is nearly always mischievous. He is, in the truest sense a trespasser upon the lumberman's common rights, and uses a government patent very often as a device to take off timber already covered by the lease of the large operator. What a menace the fake settler is to forest protection need not be enlarged upon. Having no considerable stake in the district, he plays with fire for his own ends and is not usually amenable to punishment when his carelessness burns down hundreds of thousands of dollars worth of a neighbor's timber.

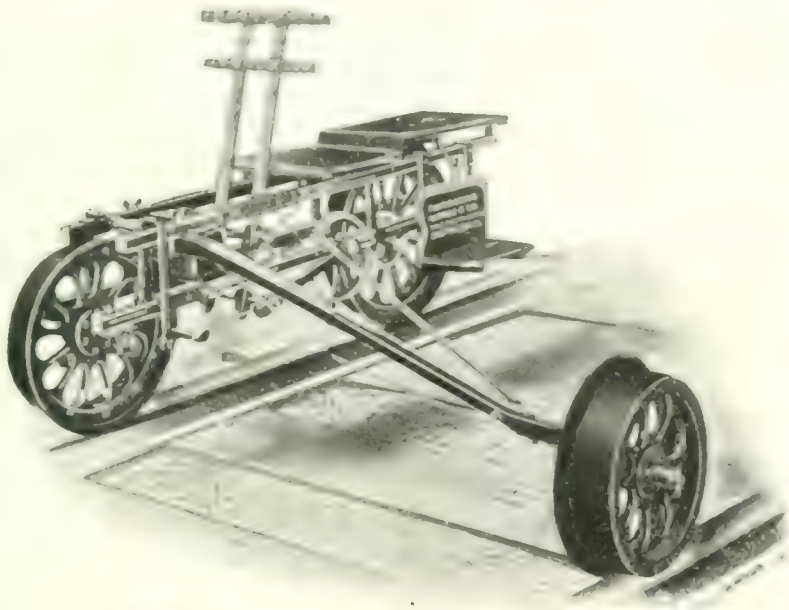
There seems no doubt that whatever the influence at work to foist these petty speculators upon the timber growing districts of any Canadian province the consequences are vicious, and should be recognized as immeasurably outweighing every other consideration.—R. B.

A FRIENDLY FORESTRY RIVALRY.

It is easy for all of us to shut the stable door after the horse has been stolen. We sympathise deeply with our friends in the States over their national calamity. Perhaps the best method of showing our sympathy would be by taking up such an active forestry policy in this country as to give the world a lead along a new and better path. If Canada and the States would join in a friendly rivalry of this character both countries would gain enormously.—*Medicine Hat Call.*

MATCH COMPANY AIDS CAMPAIGN.

At the request of the Dominion Parks Branch, the E. B. Eddy Company has recently put into effect a very excellent precautionary measure against forest fires. This company is now printing in striking colors in attractive design on their match boxes an effective fire notice, warning the public not to throw away burning matches, especially in the woods. It is a well known fact that many forest fires are due to carelessness in handling matches.



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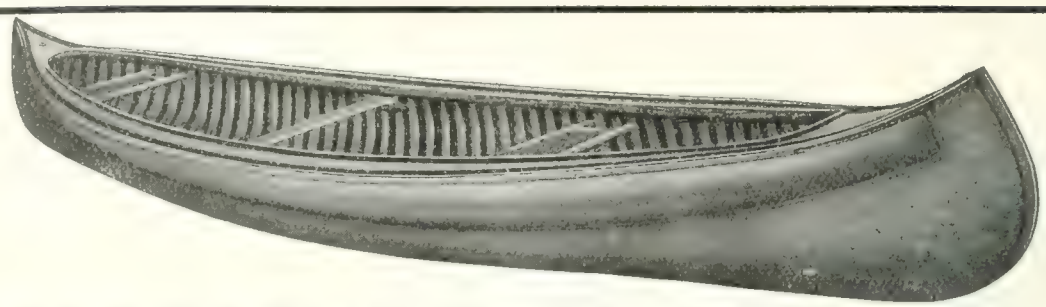

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BRITISH ADMIRALTY ORDERS.

The British Admiralty has been buying large quantities of timber for war purposes of late and the Hastings Mills of British Columbia at Vancouver recently secured an order from July in tonnage supplied by the Brifir. This will go forward in June and them for 10 million feet of Douglas tish Admiralty.

FORESTS DESTROYED — MILLS IDLE.

"Many people do not realize it, but it is a fact that in 1825 there were in New York State more waterwheels than there are today. Our streams have been drying up by the ruthless cutting down of our timber and neglect of measures to replace it by reforestation. I will not say it was all done ruthlessly—some of it was necessarily cut for the clearing of agricultural lands—but we all know that far too much of it was done ruthlessly, without regard for the future and future generations. On our own river, the Black river—the second in importance in the State—the flow varies from 40,000 cubic feet a second in the springtime to only about 400 cubic feet a second in the summer time. As a result, for about four or five months in the year we are unable to run our mills efficiently."—*From an address by E. N. Smith, of Watertown, N.Y.*

Mr. K. Vavasour, graduate of the forest school of the University of New Brunswick, has been appointed Forest Assistant on the Porcupine and Pasquia Forest Reserve, with headquarters at Usherville, Sask.

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Motion Pictures to Stop Fires

An interesting departure has been made in British Columbia to make the people realize the great importance of the lumber industry and the necessity of protecting the forest resources of British Columbia from damage by fire.

Moving pictures have nowadays an educational power only second to that of the Press itself. Hence last year a number of the motion-picture theatres in the Coast province were supplied with a set of slides to be used in the intervals between the ordinary films, the pictures bearing the following legends, each supported by a typical forest scene:

"One moment please! While waiting, resolve to be careful with fire in the woods."

"Only six trees (shown in picture) but their manufacture into lumber employed 100 men for one day. Put your fires out."

"$400,000 reward! is what the lumber industry of the Pacific North West pays the community DAILY for labor, supplies, etc. **You** share it. Be careful with fire in the woods. The road to prosperity lies through the forests; don't burn them up!"

The slides were sent out under instructions from the Minister of Lands with a letter explaining the need for the co-operation of the theatre proprietors in order to reach a large body of the public inaccessible by any other means. The result was entirely satisfactory, both theatres and patrons expressing their appreciation.

This year the idea was extended, every motion-picture theatre in British Columbia receiving a set, the subjects being more direct in their appeals, as is shown by the inscriptions:

(1) "**Wage earners and Merchants!** The lumber industry already employs over half the wage earners in British Columbia, and distributes over 20 million dollars annually for labor and supplies. . . . Make it permanent by protecting the Forests from fire." (View shown of export sawmill with shipping.)

(2) "**Taxpayers!** Forests pay into British Columbia Treasury 2½ million dollars annually. . . . Prevent fires, and keep your taxes down." (Logging scene.)

(3) "**Hunters and Fishermen!** Green forests afford shelter for game, and clear water for fish. . . . Help keep them green." (Forest Guard in canoe on patrol.)

Dana W. Lusk, Jr., a graduate of Yale Forest School, 1912, is at Calgary conducting a special investigation in regard to fire damage for the Dominion Government.

FOREST RESERVATIONS IN UNITED STATES.

The lands approved for acquisition by the United States Government for national forest purposes in the east, since the purchase policy was inaugurated in 1910, now total 1,104,000 acres, representing a purchase price of $5,500,000. About $2,000,000 of the original appropriation remains available for further purchases in the fiscal year 1915. The lands favourably acted on to date include 133,000 acres in the White mountains of New Hampshire, while 971,000 acres are located in various parts of the southern Appalachians, from Virginia to Georgia. Nearly 400,000 acres were approved for purchase during the past year, at an average price of $4.96 per acre.

The first object of administration is to protect the forest against fire, for the twofold purpose of steadying stream-flow and increasing timber production. There is, however, provision for all forms of use of the forests not detrimental to their permanent value as sources of timber and

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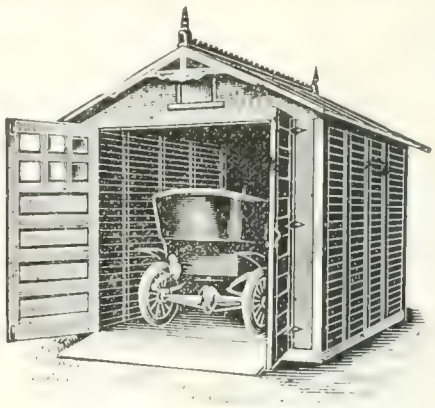

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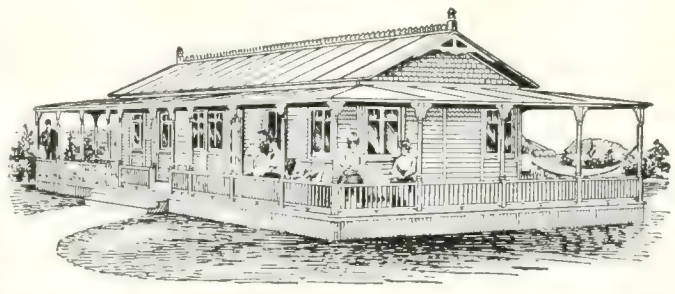

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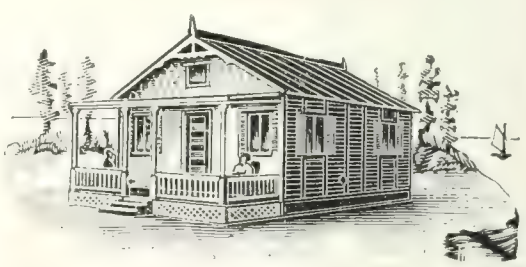


Provincial Changes

Bulletin from the Library of the Dominion Forestry Branch.

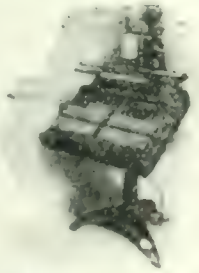
In reply to inquiries recently made from the various provincial authorities regarding "Changes that have been made during the past year in the Timber Regulations of your Province, whether by Act of the Provincial Legislature, Order in Council or Departmental Regulations," the Province of Nova Scotia reports no change made during the past year.

The only change made in Quebec is that by Order in Council of October 24, 1914, cedar cut during the season of 1913 and 1914 subject to a stumpage of $1.05 instead of the regular tariff of $1.40.

The only change reported by New Brunswick is that the penalty for exporting of pulpwood cut on Crown lands is fixed at a maximum of $5.00 per cord. A copy for the new Timber Regulations of the Province is on file 39131 (Official Publications Maritime Provinces).

The only change reported by Ontario is an amendment to the Act of 1914 "Respecting the export of pulpwood." This, it will be remembered, permitted the export of pulpwood during 1914, and by an amendment passed during the last session this permission is continued through 1915. A copy of the Crown Timber Regulations, dated March 7, 1914, is to be found on file No. 39129 (Official Publications Ontario).

British Columbia's reply has not yet been received.



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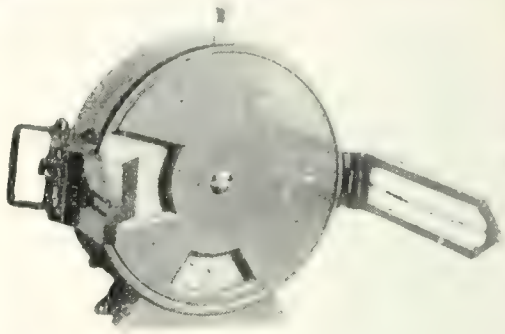

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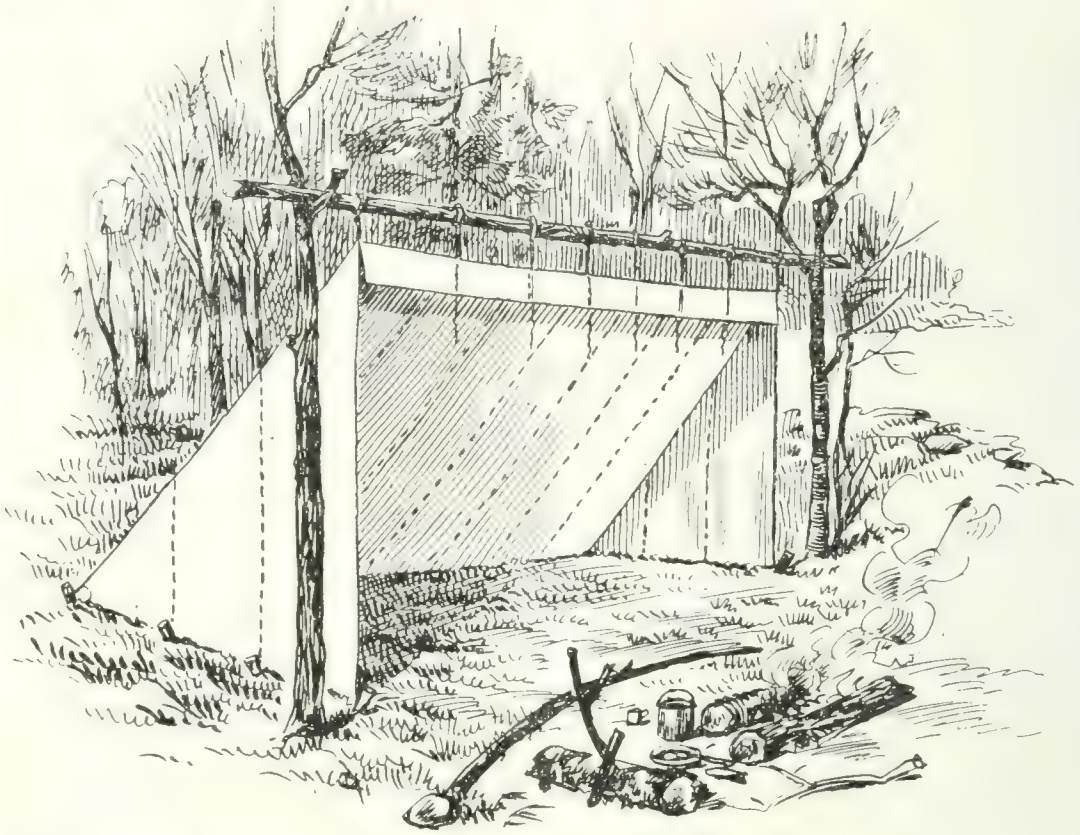

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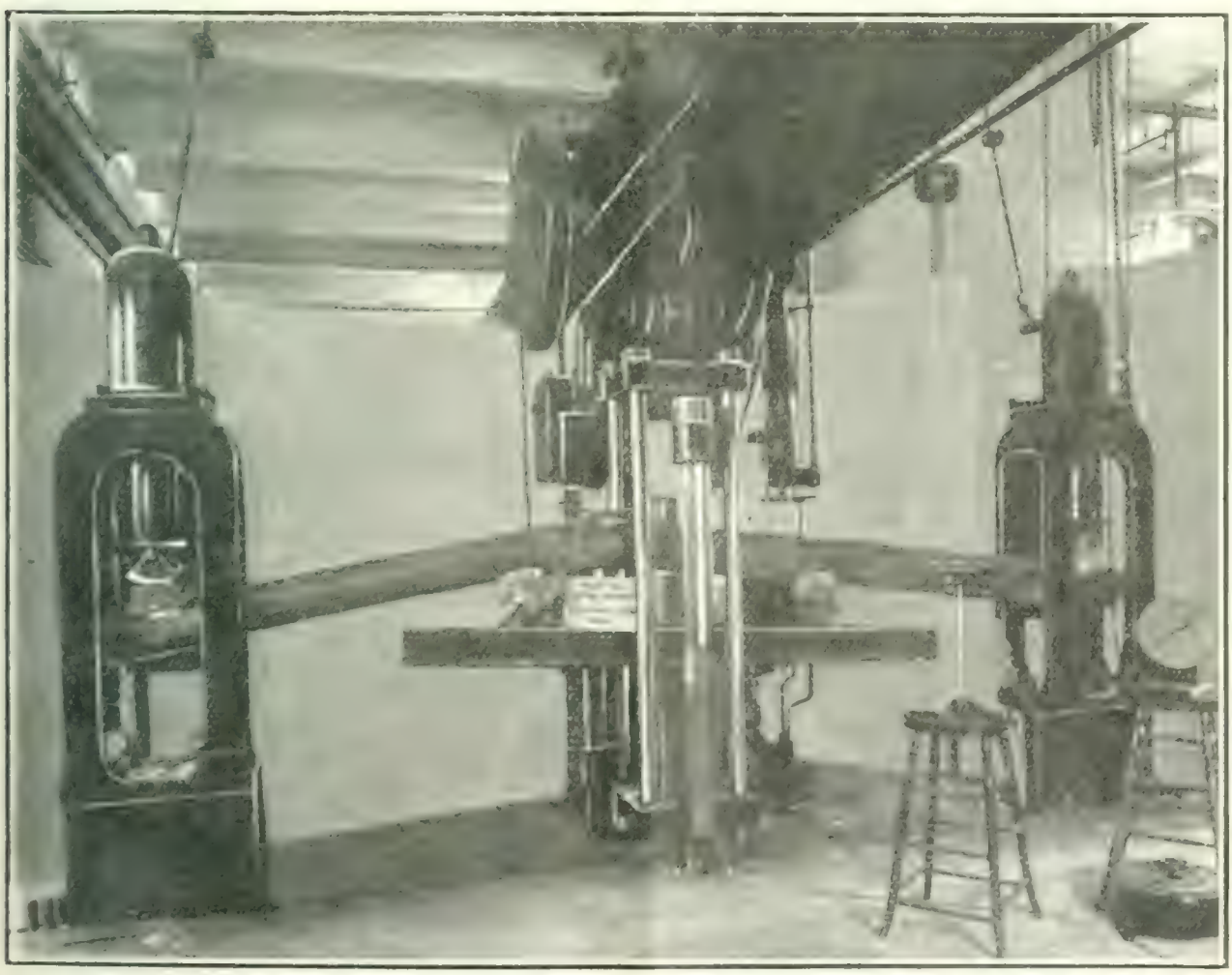
Canadian Forestry Journal

VOL. XI. OTTAWA, CANADA, JULY, 1915. No. 7

The Work of the Forest Products Laboratories

By
John S. Bates, Chem. E., Ph.D.,
Superintendent.

The Forest Products Laboratories of Canada were established in 1913 under the Forestry Branch of the Department of the Interior. The laboratories have been located in Montreal in connection with McGill University. The plan of co-operation with McGill University has proved to be a very satisfactory one and this union of Government and university in scientific research may be considered as marking an era in Canada's development. The relation of the laboratories to the university is flexible and the co-operation is primarily one of goodwill, the university having provided quarters for our laboratory work and the Federal Government, through the For-



Wicksteed Testing Machine at the Forest Products Laboratories. Method of Testing Mine Rope in Static Bending

estry Branch, paying all salaries and furnishing all equipment. While the main function of the laboratories is the carrying on of scientific research on forest products for the benefit of Canadian wood-using industries and the public at large, there is an opportunity for the students of the university to keep in close touch with the work by personal inspection and through occasional lectures, delivered to the engineering students by members of our staff. A number of specially qualified students and graduates have also been appointed on our technical staff.

The Real Function.

There has been more or less misunder standing during the early stages of organization regarding the exact function of the laboratories. The Forestry Branch is engaged mainly in such problems as administration of forest reserves, fire protection, reconnaissance surveys, tree planting, and in general the educating of public opinion in the proper care of living trees. The Forest Products Laboratories on the other hand are interested in the conservation of forest resources by proper utilization of the raw material. The work is, therefore, largely of a chemical, physical and engineering nature and has to do with the intensive study of wood itself and the many products which can be manufactured therefrom. Investigations have been undertaken with the view of extending the knowledge of wood and its products, pointing out improved methods for using the raw material furnished by our Canadian forests and finding ways and means of utilizing the vast amount of waste wood which is occasioned in the lumber and allied industries.

The period to date has been mainly one of organization and preparation for systematic, scientific work. The progress has been slow in some respects owing to the newness of this type of work in Canada and the small supply of specially trained technical men. However, I think it will be apparent from the discussion which is to follow that a real start has been made in this work, which is of such vital importance to Canada.

The Personnel.

At the beginning of the fiscal year, April 1st, 1914, the writer took over the duties of Superintendent in succession to Mr. A. G. McIntyre. At this time the staff numbered ten, made up of seven technical men and three office assistants. Twelve months later the permanent staff totaled twenty-three, while at the present time the permanent staff numbers twenty-nine, with two others appointed to commence duties later in the summer. Five of our technical men are now absent on active military service, these being Messrs. F. W. Fraser, D. M. Trapnell, L. N. Seaman, W. B. Campbell and L. L. Brown.

Buildings Provided.

Up to the fall of 1914 the staff found temporary accommodation in the Old Medical Building, granted for our use by McGill University. We are now quartered for a period of four years in the buildings at 700 University street, which were recently purchased by McGill University. The office building is a large stone structure containing about twenty-five rooms in all. Two rooms in the basement have been provided with concrete floors, benches, piping and apparatus for use as wood preservation laboratory and fungus pit. On the ground floor one room is used as clerk's office and a large room has been set aside for exhibits of forest products. The first floor provides four offices and a room for library and conferences, while the top floor contains two offices, drafting room, chemical laboratory and dark room for photographic work.

The adjoining building has been reconstructed to serve as an experimental papermill. This is a two-storey structure of brick and stone, 90' x 30' and the interior has been almost completely reconstructed and provided with concrete floors, water, gas, steam, electric light, electric power and drain connections. The mill is now fairly complete and the machinery nearly all ready for operation.

For the work in timber testing the university placed at our disposal the testing laboratory in the Engineering Building, which provides most excellent facilities for this branch of our work. A wood-working shop has also been equipped in the building adjoining the experimental papermill. A portion of our yards has been in use for the storage of wood, special precautions being taken to prevent fungus infection. A specially constructed shed has been built for the air seasoning of small wood specimens. A small sawmill on the outskirts of the city has been in use for the working up of the larger logs.

The progress of work in the laboratories will no doubt be made clearer by separate discussion of each division. The present organization includes the Division of Administration and the technical divisions of Timber Tests, Timber Physics, Pulp and Paper and Wood Preservation.

Administration.

The Division of Administration is concerned with the general operation of the laboratories, correspondence, library and so forth. A favorable start has been made in collecting a library containing information on the special work which concerns the laboratories. The main library of Mc-

ON THE NORTHERN TRAIL.

Fire ranger and dog team in the Porcupine Forest Reserve, Saskatchewan.

Gill University is consulted for general reference works so that the task of accumulating a special library is very much simplified. A special system has been developed for the collecting and indexing of information as accurate and comprehensive knowledge is necessary in connection with the library work and the answering of inquiries which are received in large number. Preliminary plans have been made for the collecting and exhibiting of wood specimens, samples of treated wood, pulp and paper, wood distillates and the other numerous products which can be obtained from the raw material furnished by our Canadian forests.

Timber Tests.

Our Hatt-Turner Impact testing machine and 30,000 lb. Olsen Universal machine have been installed in the University testing laboratory. The 200,000 lb. Wicksteed and 150,000 lb. Emery machines which form part of the university equipment have also been transferred for timber testing. Arrangements have also been made for adjusting the university's 60,000 Riehlé testing machine for our work. With very little effort and expense on the part of the Commission there has been made available the most complete and satisfactory testing equipment in Canada and too much cannot be said of the generosity and courtesy of McGill University in placing these excellent machines at our disposal.

Project No. 1, "Mechanical and Physical Properties of Canadian Woods as Determined by Tests on Small Clear Specimens" was undertaken for the purpose of establishing the strength characteristics of the important Canadian wood species. The testing procedure includes eight strength tests—static bending, compression parallel to grain, compression perpendicular to grain, shear, tension, impact bending, cleavage and hardness. The first species under test is Douglas Fir, obtained from Alberta and British Columbia. The results have shown that the fast growing Douglas Fir of the Pacific Coast has unusual strength and that the slower growing and smaller mountain types, although more affected by knots and other defects are of very good quality. The tests confirm the fact that our Canadian Douglas Fir is a first-class structural material.

Project No. 2, "Strength Functions and Physical Properties of Nova Scotia Mine Timbers" has been carried on during the last half of the year in connection with a general investigation of Nova Scotia mine timbers instituted by McGill University in co-operation with the Forestry Branch. Over seven hundred representative pit props and booms were obtained from Nova Scotia, including five species — Black Spruce, Balsam Fir, White Birch and Yellow Birch. Most of these timbers have

(Continued on page 135.)

Methods of Tree Doctoring

How to distinguish good repairing from bad—An expert's explanation of an over-talked science

By B. R. Morton, B. Sc. F.

There are many reliable tree repairing firms doing work throughout the towns and cities of Canada, but unfortunately for the tree-owner and the trees themselves there are also many men contracting to do this work who are far from qualified, relying largely upon the owner's ignorance. Hence the work they do is often worse than useless. It is hoped therefore that the following lines will be of some assistance, first to the tree owner who is hiring repairers and desires to know whether or not the work is being done thoroughly and, second, to the man who is not in a position to employ a reliable repairer and finds it necessary to do the work himself.

The fundamental principles of tree repairing may be summed up as follows:

1. The removal of all decayed, dead or diseased portions of the tree.
2. Completely sterilizing and waterproofing all freshly cut surfaces.
3. Bolting and strengthening when necessary.
4. Filling in the cavities and leaving the work in such a condition that it will heal rapidly.

All dead, diseased or decayed portions of the tree should be removed. Large limbs which are too far decayed to make it worth while trying to save should be cut off.

In the removal of limbs care should be taken to leave a clean smooth cut close to the trunk or portion from which it branches and not leave a projecting stub the end of which may never properly heal over. Cuts made close to the trunk will heal over in much less time. In the case of a large limb it will be necessary to take precautions to prevent it from dropping when only half cut through and ripping with it a portion of the trunk and bark. To overcome this the limb should be supported until entirely cut off, or better, first remove a portion of it in order to leave a good sized stub and then remove the stub.

Removing Decay.

All decayed or diseased matter which cannot be removed by pruning must be completely cut out. Decay or rot is the result of the growth of fungi which have gained entrance to the tree through an opening in the bark, usually the result of a wound, and then slowly spread in all directions throughout the wood. To prevent further spreading all decayed and diseased insect-eaten and discolored wood must be removed. The opening at which the rot-producing fungus has obtained entrance is usually visible on the outside. It is often very small and is not always an indication of the extent to which the decay may have spread within.

To properly remove the diseased portion of a trunk it may be necessary to make several openings or even cut out a considerable portion of the side of the trunk. However, openings should be kept as small as possible. Long narrow or small oval vertical openings or wounds will heal more rapidly than those of any other shape. Two socket-handled gouges (¾ and 1 inch wide), a chisel, a mallet, a knife, a saw and a ladder are about all the tools needed.

How to Treat Wounds.

The edges of the bark bordering on wounds should be smoothed off with a

very sharp knife. The cleaner and smoother this edge is cut the more rapidly will it heal. Immediately this is done cover with shellac the freshly cut margin. Many minutes should not be allowed to elapse between the cutting and the shellacing for the full benefit of this treatment will not be derived if the surface is not visibly moist with sap. This shellacing prevents the cambium layer or living tissue immediately under the bark from drying out and thus the bark itself is prevented from drying back for any distance from the margin of the wound. This treatment applies to the border of all wounds whether caused by the removal of limbs or the removal of decay.

After the margin has been shellaced the surface of the wound should be painted with ordinary commercial creosote, being sure to cover every portion of the exposed wood. This will act as a preservative. Then give the whole a coat of coal tar to make it waterproof. If desired the creosote and coal tar may be mixed before applying ($^1/_3$ creosote). The interior of all cavities must also be thoroughly painted with creosote and tar.

Bolting the Trunk.

Before filling with cement, in the case of trees with very large cavities in the trunk, it may be necessary to run one or more iron bolts through them in order that they may be

Showing well finished job of tree repairing. Note the cement sections in the base which is also bolted. Cement repairs may also be seen in the upper part of the tree. Photo taken on an Ottawa street.

strengthened. The cement filling itself aids very little in strengthening a tree. A cavity less than two feet in length rarely requires a bolt, but longer ones where a large portion of the interior has been removed, should be bolted every eighteen inches. The bolts are from ¾ to 1 inch in diameter and have heavy washers at each end. Oval washers are better than round ones since they should be countersunk on the outside of the trunk and the wound thus caused being elongated will heal more readily. Wounds caused by countersinking washers should be treated in the same way as all other wounds.

Filling Cavities.

After the cavities have been bolted, creosoted and tarred, the next step is to fill in with cement. It might be added here, that in the case of cavities with such a shape that the cement would work loose and fall out after it hardens, it will be necessary to overcome this tendency by driving many three-inch nails half-way into the wood throughout the interior. The heads of these nails will become embedded in the cement and hold it in place. When a tree has been bolted this nailing may not be necessary. Another method is to so under cut the wood near the margin of the cavity that the filling will be wider than the opening. In under cutting, however, care should be taken to have the wood at the edge of the wound not less than an inch in thickness.

The filling mixture should consist of a good grade of cement and clean sand. One part of cement to three or less of sand. The two to be thoroughly mixed before adding water. Only enough of this added to make a rather stiff mortar should be used.

The mortar may be placed in the cavity with a mason's trowel and tamped well into place. In long vertical cavities it will be necessary to start at the bottom and fill in a section at a time, holding the material in place with a piece of sheet metal until it has set, and then proceed to fill in the section on top. These sections or blocks should not be more than a foot in height and divided one from the other by a sheet of tarred roofing paper cut to fit the cavity cross-section. Before the top of a section has completely hardened it should be smoothed so that the paper can be laid evenly on it. Dividing the cement in blocks in this manner will allow for the twisting and bending a tree trunk must necessarily endure in a high wind. Otherwise the cement will in time break up and crumble out.

Finishing Off the Face.

Where the cavity extends up into the trunk beyond the top of the opening it may be necessary to cut a small sloping opening into this cavity from above and pour a more liquid cement through it.

In the case of very large cavities, fine clean gravel is sometimes used instead of sand. Stones 6 to 8 inches in diameter are also frequently used. These should be wet before being placed in the mortar and be kept well back from the sides and face of the filling.

Before each block or section has become completely hardened its face should be finished off. The face should conform to the general shape of the woody portion of the tree. It should not be allowed to stand or bulge out beyond the bark, otherwise the tree would be hindered in its attempt to cover the cement with a new growth. It is usual in filling a cavity in the first place to keep it well back and later, before the cement has quite hardened, to bring up the surface to the proper level.

After the filling has thoroughly dried the face may be painted over with paint or tar.

Trees that have been repaired should be inspected from time to time and careful watch kept to see if any further attention is required.

From a Fire Ranger's Diary

A Woodsman who Preaches on Forest Protection after Church Service—Fighting the Big Blaze

The courageous calibre of many of the fire rangers employed in the Canadian woods has been given frequent and well deserved testimony. The healthy, strenuous life, isolated from 'civilization,' continually demanding vigilance and resourcefulness has been the picturesque mark of much Canadian fiction, and not a little poetry.

Here, however, are some real pages borrowed from a real ranger's report. A more enthusiastic champion of the rights of the forest can scarce be imagined:

"Spent Sunday in conversing with church-goers on the Divine plan of Forestry for the proper usage of man, pointing out that the Creator made all things for a good purpose and for the proper use of mankind. Upholding the Forest as being one of the chief handiworks of the Almighty, and that all should look upon and venerate same as sacred in future.

"Monday.—Weather cool. Route travelled, northwards, by canoe. Very good green timber in parts, for all purposes and should be well protected. May be most of the mileage of today's travel is in the bounds of the Indian Reserve; if so, they have all the timber they require for the next generation if not attacked by fire. However, as most of the country is interlaced with creeks and waterways in abundance, forming islands innumerable, some parts will always escape the danger of fires.

"Tuesday.—On the southeast shore I noticed the ravages of fires, may be ten years ago. The bush is all dry, with a new growth of saplings and will 50 years hence be serviceable for the use of humanity if protected carefully. As the wind was blowing a strong gale we were unable to travel any farther than five miles owing to the force of the elements against muscular compulsion.

Another day.—"On close observation of natural growth on these islands it makes me feel ashamed of mankind in thoughtlessly being the chief cause of forest destruction. In walking through this island it made me feel like going through a sacred sanctuary.

"Having been wind bound for so long we were in good trim for a good paddle and this we did with a vengeance as we made about 50 miles today.

"Having received a verbal message from our Chief Ranger stating that he wanted to meet me at ———, I made haste to connect with him. We travelled for about fifteen hours and camped on two small islands, being too dark to travel farther. We camped with Rev. Mr. —— and his two men, talking chiefly Fire!

"'A fire! Look! Look!' was the first notification of huge columns of black smoke by the residents of ———. On looking in the direction, alas! it was too true! A huge bush fire was raging. Who did it? The fire ranger will have to look after it or we will all be burned out of the settlement. Besides, the fearful destruction it will cause to the country! Overhearing

these different remarks, I will (D.V.) proceed towards these fires tomorrow.

"I examined the country minutely. Found out where the fire started from and also found out that the fire made by the bear trappers had been put out to a certain extent but not altogether. It was not totally through carelessness as I could see that they tried to put it out by pouring water over their fireplace before leaving it. It was owing to a delusion on the hunters' part who took it for granted that they had put out the fire. This fire will now have to be put out when it gets to waterways; that will fence it in.

"Reached ———— settlement and asked all parties to help put out this disastrous fire, if at all possible. Most of our residents being away bear hunting at this particular date, and as it looks like rain, we will await the arrival of all the hunters and will go 'en masse' on Monday to put out the fire. In the meantime all parties will be preparing themselves with proper equipment.

"Had E—— and I——, two Indians, prosecuted for being the cause of this fire. As they proved themselves guilty and as they tried to put out their camp fire by water—it, however, having proved a baffling delusion on their part—I fined them $20 and for each to help put out the fire at their own expense, reprimanding them severely for their careless methods.

"Most of our men arrived today from trapping and we now have a complement of thirty-two able-bodied men and a few more to arrive yet. All are now preparing food, raiment and implements for fire extinguishing purposes. As I know the country well where this fire is, I am waiting until it arrives near some lakes where it is possible it can be put out without much help.

"Myself and assistant fire ranger started at 6 a.m. with 45 men all equipped with axes, spades, coal oil cans and other cans, also old clothes and bags for fighting fire. Got the help of a horse and car for taking 15 canoes over the four-mile tramway. We arrived at the extreme end of the lake and camped on a small island where we could get a good view of the raging fire. As this will be the first experience of these men in the art of quenching fire I gave them advice to the best of my wits—and retired to bed.

"As soon as all hands had dinner I at once superintended the back burning of a grass swamp, putting out the back line of the fire as we made progress. And after all hands working hard we managed to gain a fire belt of about three miles. In the thick bushes we cut down the trees and with spades, hoes, etc., cleared the sod for ten feet as a fire guard.

"From 1st day of June to 5th we managed to finish a fire guard 12 miles long running almost east and west. By fire guard I mean a scraping of all dead kindling matter right to the gravel bed, besides felling an outline of trees, 20-foot clearing space, and back-firing every inch of 12 miles along the fire guard.

Some Days Later.

"As this fire has cost our Government a big sum I am pleased to say it will save a big piece of timber now that it has been disposed of in good shape."

The ranger closes his diary with a stanza bidding adieu to the bush fire and trusting that he may never meet it again.

Forest Protection in Quebec

By W. C. J. Hall, Chief of the Forest Protection Branch of the Quebec Government.

That Quebec Province has made good progress in the matter of forest fire protection, few will dispute. Mr. W. C. J. Hall, a valued director of the Canadian Forestry Association, recently undertook to correct an article published in the Montreal 'Gazette,' which asserted that forest fires were raging without much effort at prevention. How effective was Mr. Hall's reply may be seen by the following, which gives a first-rate summary of the whole provincial situation in regard to the problems confronting Mr. Hall's department.—*Editor.*

As regards other provinces I am not prepared to speak, so my remarks are confined to conditions in Quebec.

The Local Government holds the unlicensed lands and the lands under license to cut timber, "timber limits"; the lands sold have passed out of its hands and are under the care of the proprietors.

Thus the Government has in round figures some 70,000 square miles under license to cut timber, plus a much vaster territory in rear thereof to look after as regards protection from fire. The Government expects an owner of land to take necessary precautions, besides which the law provides that he shall do so and prohibits the setting of fire in certain periods, supplemented by the prohibition at all times when a drought prevails.

It is obvious that the Government must devote its attention to the protection of Crown lands licensed or unlicensed, and I beg to state in my capacity of Chief of the Forest Protection Branch of this Province that the Government has done and is doing its full duty towards this object, and stands prepared at this or any other time to compare results with any other province of the Dominion or any State to the south of the 45th parallel. We have at least 25,000 square miles under the co-operative system of protection, and we have most urgently recommended the limit-holders in the remainder to adopt the same system—in this connection let me suggest to the editor of the Gazette that he obtain from the Department of the Interior, Ottawa, Bulletin No. 42, and after perusal of same I feel confident he will admit that the Government is using due diligence to protect the Provincial domain.

Well Under Control.

We have been suffering from drought for over a week now, with the ground "dry as tinder," which is wholly a correct statement, and have had some very serious situations to contend with, but thanks to the unstinted efforts of the lumbermen and their staffs of fire-rangers, and the Government inspectors, and the co-operative system, there is no serious conflagration to report on Crown lands. Upper Ottawa is safe, Lower Ottawa has all fires but one under control, on the St. Maurice no large fires and small ones extinguished or fully controlled. Fire took place on the du Loup limits, not under the co-operative system. No reports from this locality. Bad fire on the Batiscan, reported extinguished last night. Fire in settled township at discharge of Lake St. John; origin, a settler burning brush. Fire on river Murray, reports just in that it is extinguished. No fires reported in the Gulf region, or on the north of the peninsula of Gaspe. Settlers' fires menacing Crown lands in Baie des Chaleurs, but being fought successfully. Several fires in Eastern Town-

ships, a situation where limit-holders and settlers adjoin one another in many cases. We have had several fires, all arising from culpability of settlers, but all except one extinguished or under control. Thus it is abundantly evident that the Government is looking after the national asset, the Crown forest, and notwithstanding the trying conditions, the damage is very slight, and the situation is controlled unless the drought is further prolonged.

Let it not be supposed for one moment that the patrol is confined to the Crown lands. On the contrary, we well know that the "danger spot" is the border line between licensed Crown lands and the settlers and the inspectors and rangers are continually going round warning the settlers against setting fire, posting up placards, appealing to the clergy in every parish to exercise its influence, and generally safeguarding as far as is possible the public interest. Furthermore, in order to obviate danger from settlers' fires, a system of burning permits has been inaugurated which gives promise of very satisfactory results and by which, by observing certain provisions, a settler is permitted to burn his slash in prohibited season, under superintendence of an inspector or a duly qualified fire ranger.

It is claimed that the Government does not punish delinquents for infraction of the law; in rejoinder allow me to state that last year about one hundred actions were taken, and judgments obtained in nearly every instance. As to the question of what fine is allotted, that is a matter that rests with the judges on the Bench and beyond the control of the Government.

Settlers' Fires.

Complaint is made, not in the editorial referred to, that in the district north and northeast of Montreal, settlers fire their brush and the fire extends beyond their properties and damages their neighbors. Such localities as Sixteen Island lake and environs are made mention of; now these places are miles and miles from the nearest outlying lot belonging to the Crown and quite remote from the timber limits—would it be reasonable to expect the Government (these lands having passed out of its hands many years ago) to take the men from Crown lands and station them in such localities to protect private interests? It would be impracticable to do so, but let me say that in many cases similar to the above, when damage has been done, the Government has on obtaining the needed proof, instituted actions and punishment has been meted out to the offenders. Let it be well understood that any individual suffering damage from fire by reason of his neighbor infringing the law has a good case against that neighbor, and it is not obligatory for the Government to act, but as above stated, it often does act, and this in the public interest.

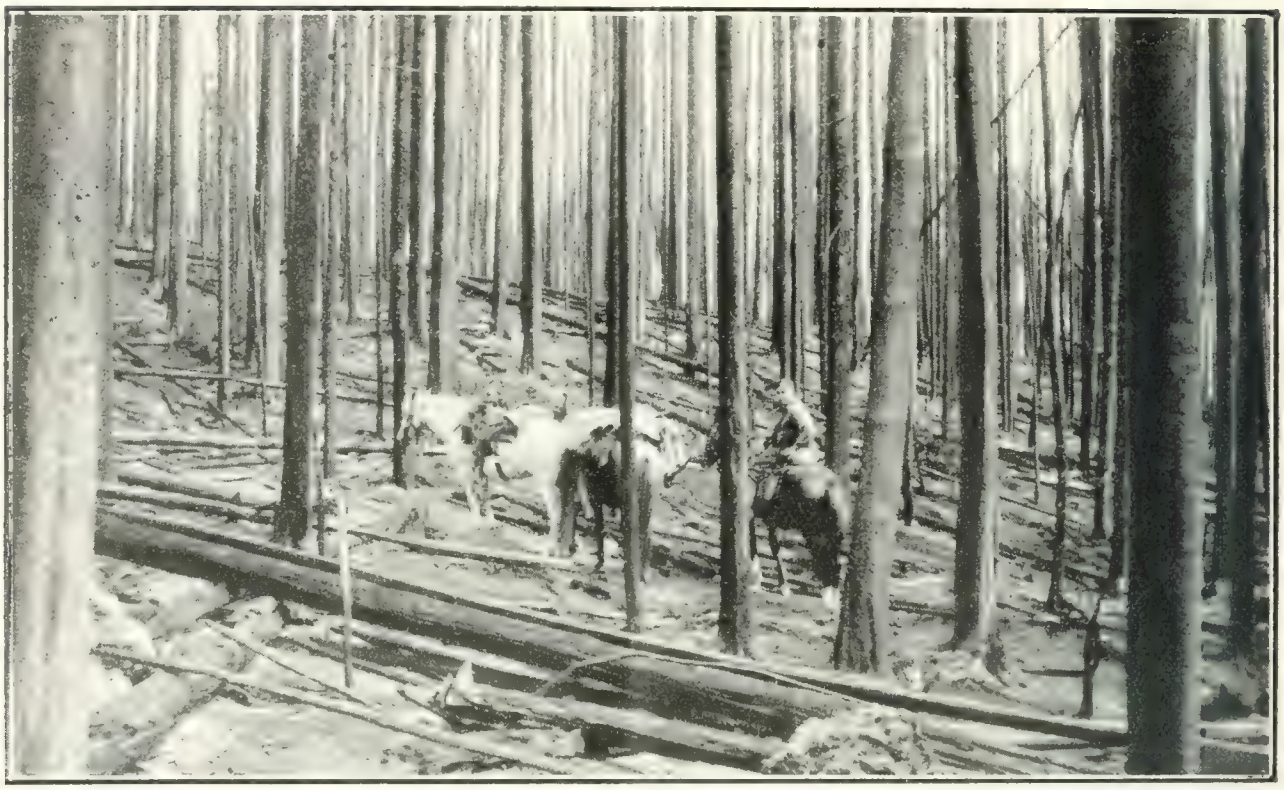
All the railways in the Province, save the I.C.R. and N.T.R., are under my control as regards patrolment. I act as Provincial Fire Inspector for both the Federal and Local Governments, under the orders of the Chief Fire Inspector for the Dominion. Thus there are some twenty odd railways to be attended to, and special patrols are installed on any hazardous sections and maintained throughout the season. Since the inauguration of this railway patrol three years ago I beg to state officially that a most marked change has taken place. Today none can say that the railways are a menace such as they undoubtedly were in the past, vide the territory between Quebec and Lake St. John as an example. The warm and hearty co-operation which has been forthcoming from every railway company, with one or two exceptions, has been a revelation not only to myself but to many others. Notable examples are the C.P.R. and the Q.C.R.

The result of this work is that to-day in a most critical situation, the fires reported on railways are incipient and of a negligible character as regards amount of damage. I emphasize the word incipient, as it shows that the men are on the spot at the beginning and snuff out what might, if neglected, be serious fires. The National Transcontinental is the most dangerous problem in this line which we have to contend with, the contractors have completed their work, the G.T.P. has not taken over the road, and it is not under the control of the Board of Railway Commissioners of Canada. Nevertheless the Hon. Minister of Railways is giving the matter attention and precautions are being taken, but it takes time to confer and organize a thorough patrol on several hundreds of miles of railway. Some large bodies of pulpwood along this line have just been burned, and some other fires are reported, but I am meeting with co-operation from the superintendents and hope to avert any disaster to the forests.

Knowing as I do that the staff of officers under me and the fire-rangers have been doing yeoman service during these trying times and with very good success, it is my plain duty to defend them and make it clear to the public that forest protection in this Province is very far from being "pitifully weak," notwithstanding the fact that there are some fires in the settled townships to the north of Montreal. The Canadian Forestry Association is very likely the best posted organization as regards forest protection in the Dominion. I would therefore ask the Editor of the Gazette to consult that body and get from it an opinion as to whether the Province of Quebec is up to date or not.

W. C. J. HALL.

The Columbia River at Parsaw, B.C., showing overflow in high water season.



A vivid testimony to forest fires. The photo was taken in the Revelstoke district and shows damage done along the Spillmacheen in August, 1914.

Settlers' Slash and Forest Loss

Quebec and British Columbia obtained good results from permit systems—The Settler who confessed.

The burning of settlers' slash is one of the outstanding causes of our annual forest losses.

Particularly in Northern Ontario, Quebec, and British Columbia and to a moderated degree in New Brunswick, the labors of the fire rangers would materially lessen and forest destruction be curtailed, were strict 'permit' laws and strict enforcement everywhere in operation.

The testimonies of men in charge of forest protective work refer to settlers' fires in language that does not mince its meaning. Reports reaching the Canadian Forestry Association, the Railway Commission and other public bodies, while gladly admitting the decreasing number of 'railway fires', make no such statement of improved conditions among the settlers. So far has the control of settlers' fires fallen behind other concerns of forest protection that the railways are spending considerable sums annually in extinguishing conflagrations unquestionably due to farmers along their routes.

Good Work of Clergy.

What a vicious contribution these clearing fires make to the annual total of destruction may be estimated by some such official figures as the following: In Manitoba, Saskatchewan and Alberta, outside the forest reserves, 480 fires occurred in 1912 and of this number 108 were due to careless clearing, with 131 due to 'unknown causes'. In the territory con-

trolled by the St. Maurice Forest Protective Association no less than 80 fires last year were traced positively to settlers—a serious proportion, but at the same time a great improvement on the previous summer when no less than 151 out of 306 fires were of the settlers' doing.

Quebec has undoubtedly made a courageous start in applying the permit system, establishing a closed season during which no fire shall be set unless a permit is issued by an officer of the Forest Protection Branch. The administration of this law has been conscientious and, with wider knowledge of its good objects and an increased staff of officers, may introduce the province to an advanced stage of fire immunity. Scores of writs of summons have been served upon guilty farmers and when local magistrates apply statutory penalties with the same thoroughness that characterizes the ranger's end of the work, few communities will further resist the Department's orders. The splendid service rendered by the clergy of Quebec to the cause of forest protection doubtless will prove effective in reducing hostility to the permit law.

An Open Confession.

The culpability of the settlers is not a phrase to shield the culpability of others. One discovers references such as the following wherever Canadian forest fires are written of: "We have had several fires, all arising from settlers but all except one extinguished or under control."

And again, in a Watertown, N.Y., interview with a pulp company's president: "There were many forest fires in that section because of the fact that the Canadian farmers attempted to burn out stumps and brush on their clearings and did not give proper attention to the work. At one point the logs were so thick in the river that fire ignited their exposed surfaces and caused such a blaze that a steam fire engine had to be shipped in from a distance of forty miles."

From the settlers' point of view, many excuses are within reach. Rangers in the employ of the St. Maurice Forest Protective Association have been told repeatedly by 'homesteaders' located along the line of the Transcontinental below La Tuque that to fulfill their Government obligations they must set out fires no matter what the season may be.

Some of these men have admitted in the presence of inspectors that their lots were taken not for cultivation purposes but solely for the valuable timber thereon. (This amply bears out a statement regarding the 'Fake Settler' published in the June issue of the *Journal.*) One party frankly informed an inspector that with the assistance of a small boy and horse he had cleared over $1,100 during the winter of 1913-14 and over $500 during the following winter. When asked what his intentions were, once the timber was cleared from the land, he confessed that he would move on to better 'pastures' as the soil of the lot was of little use for anything but wood crops.

British Columbia's Example.

It is stated of the British Columbia regulations which compel all settlers to observe a close season for slash burning or to take out a permit, that the farmers are giving the Act willing co-operation. In 1914, out of 11,523 permits issued, only 128 permit fires escaped beyond control, forming 7 per cent of the 1,832 forest fires. Of the 128 fires causing trouble and some loss, even under the permit system, it is instructive to note that many escaped control because of sudden high winds which in at least one case lifted the body of the fire 300 feet into the adjoining woods. The permit system does not pretend to obviate all fires, but who will doubt that it offers the most sensible and economical solution to the problem of settlers' slash?

Forest Fire Situation

Good rainfall through latter part of June and most of July—Rangers defeat incipient blazes

Reports received by the *Canadian Forestry Journal* from all sections of Canada up to the middle of July indicate that the situation in respect to forest fires is most favourable. Outbreaks there have been during June and July but in the patrolled acres prompt action by rangers isolated the destruction and held down the loss to small dimensions. June 8th seems to have marked about the last of the dangerous fires in Northern Ontario and Quebec although many small fires since that time have been dealt with. The rainfall has been uniformly good.

Detailed reports of fires occurring in the Prairie Provinces this spring and early summer have come in. These declare that the most serious fire danger was experienced during during the period from the middle of May to the fourth of June. Rain followed by snow came on the latter date and put out all the fires then burning. The weather since has been pretty wet all over the West so that there have been practically no outbreaks. The dangerous season in the latter part of May was due not only to lack of rain during the spring but also to a dry fall the previous year followed by a winter with exceptionally light snow fall, so that the swamps and smaller creeks were all dry and fire could run unimpeded in any direction and was very difficult to put out. A large number of men were employed on the larger fires and consequently the damage was not any more extensive than has been experienced in several dry seasons in the past. Moreover the fire danger was confined mainly to Manitoba and Saskatchewan. The weather conditions in Alberta were rainy.

AT THE PACIFIC COAST.

Victoria, B.C., July 8.—Advices reaching the Minister of Lands concerning the fire situation throughout the Province are for the present satisfactory, although the immediate prospects, unless rain falls, are rather ominous in certain sections.

During the early part of the past week rain fell in the Hazelton, Nelson, Cranbrook, Vernon and Kamloops districts, as well as in the eastern section of the Fort George division, followed, however, by clear, warm weather, with resulting increase in the fire hazard. In the Tete Jaune district, conditions are reported as being reasonably safe, in view of the hot, dry, windy weather.

The prevailing heat, accompanied by a clear atmosphere and wind, with resultant drying out of vegetation, has been responsible for several fires in the Coast districts, outbreaks being reported at North Vancouver, Langley, Delta, Cheakamus, Half Moon Bay, Texada Island, Toba Inlet, Thurlow Island, Green Point Rapids, and Loughboro Inlet, the area burned over being approximately one thousand acres, principally slashings, and the damage to merchantable timber fortunately small.

Four fires, all under control, have occurred in the Island district, two of which were at Parksville, and a third at Courtenay.

The satisfactory conditions which have hitherto prevailed this year have been merely normal, and it is at this time and under the climatic conditions at present prevailing that the highly dangerous stage is reached, attended by risk to life and property.

FROM NOVA SCOTIA.

A report to the *Journal* from Nova Scotia, dated June 22nd, states: "We have had a cold wet spring and it is still very disagreeable. Notwithstanding the wet weather some bad fires have been reported; one on the Jordan river, Shelbourne County, evidently set intentionally in several places, burnt up camps and a couple of a million feet of logs that were hung up in the woods. Another in the same country where 10,000,000 feet of lumber was piled was set by the railway, but fortunately was got under control."

Dividends and Forest Guarding

Sound financing of wood-using companies demands elimination of fire risks as far as possible

In a very few years no prospectus of pulp, paper, or lumber company will go to the public without a plain declaration of the management's policy in regard to protection of the limits from fire. As the 'Financial Post' in a recent issue pointed out, there is no more important feature than the preservation of the forest reserves which provide the raw materials. Keen competition may be met by foresight and judgment. But fire may at any moment sweep away part at least of the foundation on which all business policies and plans depend. Under these circumstances, as the 'Post' says, investors in securities based upon the pulp industry are deeply concerned with safeguards against the fire menace.

The St. Maurice Valley Forest Protective Association illustrates how far from quixotic is the idea that forest conflagrations can be defeated by a reasonable show of human strength and ingenuity. The territory patrolled comprises over 12,000 square miles, or over eight million acres. The staff during 1914 consisted of a manager, Mr. Henry Sorgius, a clerk, six inspectors, and 54 rangers. Two hundred and thirty-one fires were reported, of which 22 were set by river drivers, 10 by fishermen, 56 by railways, 80 by settlers, and 46 unknown, in addition to some others of miscellaneous source. One-third of a cent per acre represented the cost of fire-fighting and patrol—which reckons at $2.25 per square mile. It is probable that 1915 will show a ratio considerably decreased, owing to the better weather conditions.

The Lower Ottawa Forest Protective Association is close neighbor to the St. Maurice, patrolling a territory comprising over 11,000 square miles or over seven million acres on the watershed of the Gatineau, Lievre, Rouge, Nation and Coulonge rivers. The staff utilized last year was a chief inspector, three inspectors, and 52 rangers. Although the Lower Ottawa started work only when the dangerous 1914 season was showing its temper, excellent service was done. The fire loss did not exceed eight-tenths of one per cent of the amount of timber protected. Seventy-two out of 154 fires were caused by settlers, 15 by fishermen and sportsmen, 17 by lightning, 12 by drivers and woodsmen, 4 by railroads, 9 by trappers and Indians, and 25 of unknown origin. The total cost of the patrol and fire fighting work was $1.91 per square mile, or less than three-tenths of one cent per acre.

Ontario Forests and Water Powers

Unless Watersheds are guarded from destruction, the power value of scores of streams will disappear*

It has long been taken for granted that the water powers and forests of Ontario hold the key to future prosperity. Until a few years ago neither resource was recognized as of such importance that governmental policies need give them much recognition or that special departments should be created to study their problems and direct their uses in the public interest. The coming of the hydro-electric commission and the campaign of education which followed probably did more towards the awakening of popular interest in water powers than could have been accomplished in half a century by commonplace methods. The forest, unfortunately, has had no such powerful champion to turn its generalities into matters of particular personal concern. It has never been a political issue and has never had the assistance of a great popularizing force such as the water powers enjoyed through the advocacy of Sir Adam Beck and his disciples. Were there to be created such a body as a Forest Commission, preaching a gospel of "the forests for the people," and given the backing of a strong political party, who may doubt that trees would take their place with horsepower as subjects of debate across the domestic table and the counter of the country store.

Whether or not the forests follow the water powers into the political arena, the same popular interest that took hold of the vision of cheap power must as firmly take hold of the demand for forest protection. The two are absolutely inseparable. Niagara does not meet the need of more than a strip of Greater Ontario, and other water powers must be the solution of future industrial and municipal demands for electricity.

All Communities Suffer.

In all parts of Ontario one may see hundreds of instances of distress and loss brought upon communities by the complete drying out of water courses or the wild fluctuations between spring floods and midsummer drought. Mills falling to pieces from disuse, or revamped for steam power, their wooden dams high and dry in the gulleys, are to be met in any cross-country journey. In the larger centres, such as Brantford, Paris and Galt, what citizen does not grimly appreciate the problems of a water power made uncontrollable by forest destruction, giving too generously in the spring months, stinting the water wheels in August? What citizen of London, Ont., has not wished that the annual rampages of the denuded Thames could be modified to save the taxpayer's pocket? What mill owner in Georgetown would not give a heavy sum to secure an even 12 months' pressure?

Speaking generally, water powers are valuable in proportion to the amount of water available at the periods of low water, which usually occur in August and September and in February and early March. One of the most careful students of this question, the late Cecil B. Smith, C.E., asserted that of the chief features affecting the uniformity and total amount of flow, only three were within the control of man: condition of soil, whether cultivated, pasture, or woodland; storage, natural or artificial; control of run-off from storage.

Where the Remedy Lies.

The trio of factors which man may direct as he pleases are sufficiently important to place the responsibility for poor water powers on his shoulders alone. In southwestern Ontario, for instance, with such rivers as the Nottawasaga, Saugeen, Maitland, Ausable, Thames, Grand, Credit and Humber rivers, every one of which possessed originally valuable water powers, but without any natural storage of water except in the soil, the ruthlessness of forest destruction has brought their water powers practically to the point of ruination. It would be too much to suggest that a government buy back the valuable farm lands in this area and restock them with timber. Since the original blunder was permitted, expert opinion cannot prophesy anything better than that the districts served by these rivers will have to look to Niagara for their future supply of electrical power.

The situation in Central Old Ontario is, however, substantially different and offers an opportunity for immediate governmental activity. The French, Maganatewan, Muskoka, Severn, Trent, Moira, Rideau, Mississippi, Madawaska, Bonnechere, Petawawa and Mattawan rivers all rise from a common plateau, much of it still in forest and only a small portion fit for agricultural purposes. A great portion of this area shows pitiful mismanagement of the public interest. Although there exists much virgin forest, the cutting in other sections has been severe, and a combination of preventible causes has resulted in bad fires, leaving considerable tracts in wrecked condition. Unless these various forces which are heading the forests for destruction can be offset by comprehensive and intelligent action, the water powers of the whole region must sooner or later be wiped from the list of assets. The condition of the denuded areas is closely matched by the poverty of much of the human population. Hundreds of families have been permitted by an almost criminal indifference to take up homesteads on land absolutely unfitted for growing crops. One would think that by this time, Canadian provinces had witnessed enough pitiful evidences of the folly of giving non-agricultural land to applicant farmers, but the exact duplicate of a thousand past warnings may be seen to-day all through this great watershed.

What Experts Suggest.

It is generally agreed that to reforest on cleared land where close planting would be necessary, would demand too much expense, in the present state of public opinion. One expert recently pointed out the proper course would be to hold this central plateau as it is at present and possibly even to reforest some partly cleared or cut-over districts, to limit the cutting of timber to ripe trees and under Crown supervision, to guard carefully from fire, and to create a system of storages for water near the source of the various rivers mentioned. Lakes already exist in abundance. All that is needed is the construction of inexpensive dams and to carefully manage them with the single object of a uniform flow of water. Not only would such a system provide a source of from 200,000 to 300,000 horsepower, representing at least 1,500,000 tons of coal a year, but would build up an extensive forest district from what is now mostly useless land, producing high public revenues and supporting many industries.

When an Ontario river is "out of hand," as far as uniform service is concerned, the forest somewhere beyond is usually also "out of hand."

(*This article by the Secretary of the Canadian Forestry Association appeared recently in "The Monetary Times.")

FROM COAST TO COAST

QUEBEC'S FIRES.

The largest fires in Quebec province so far this year have broken out on limits outside the zones of the protective associations. In such instances efforts were made by the companies' own rangers to deal with the outbreaks but too often the inexperience of the fighting force proved a serious handicap.

A GUIDE FOR SETTLERS.

A circular letter has been issued to settlers and farmers by the British Columbia Government embodying the regulations concerning fire permits, giving rules for guidance when burning slash or brush in land clearing operations and information as to what should be done when fire breaks out. It also appeals to the citizens to help eliminate the fire menace.

GYPSY MOTH DANGER.

The presence of the gypsy moth in shipments of various forest products including pulpwood, from the United States, has led to the passing of an order-in-council as a result of which all "forest plant products, including logs, tan bark, posts, poles, ties, cordwood and lumber originating from any one of the States of Maine, Massachusetts, New Hampshire, Connecticut and Rhode Island, shall not be admitted into Canada unless accompanied by a certificate showing that they have been innspected by the United States Department of Agriculture and found free from the gypsy moth."

MORE U. S. RESERVES.

On Wednesday, September 22, members of the American Forestry Association and delegates of various Forestry Societies, Boards of Trade, Chambers of Commerce and other organizations of the New England and Southern Appalachian States will appear before Secretary of Agriculture Houston at Washington in conference. They will ask the Secretary to recommend to Congress the passage of a bill providing for an appropriation of $10,000,000 to be expended at the rate of $2,000,000 a year for five years in the purchase, under the Weeks Act, of more forest reserves in New England and in the Southern Appalachians.

C. P. R.'S GOOD WORK.

An incident which shows the determined stand taken by the Canadian Pacific Railway to deal with forest fires along its lines occurred recently in Quebec. Sparks from an engine set fire to grass on the right of way and spread to a patch of timber. Quick action by a ranger of the Laurentide Company confined the destruction to about three acres. The next day the defective engine was taken out of service and a special patrolman was put on the track with a track velocipede to follow up all trains. The section foreman was reprimanded, the master mechanic being called upon also to explain his conduct. In four days the Forest Inspector had appraised the damage and submitted his report to the Claims Department of the railway. This is indeed an example of prompt and thorough action.

B. C.'S SHIPPING PROBLEM.

Mr. H. R. MacMillan, Chief Forester of British Columbia, is engaged at present as special trade commissioner for his Government, in making a study of the transportation question since the lack of shipping is the British Columbia lumberman's chief problem. Mr. MacMillan's trip will include France, Italy and Spain, South Africa, Australia, New Zealand, India, China, Japan, and South America.

THE COVER PICTURE.

The picture from which this month's cover for the *Journal* was taken represents an actual photograph of a moose swimming a stream in the Rainy River country along the lines of the Canadian Northern Railway. While engaged in his work as fire ranger on the Dawson canoe route, H. J. Bury saw the moose take the water and by following closely in its wake secured the unique picture for which the *Journal* is indebted to the Canadian Northern.

MUST BURN THE TOPS.

The Quebec Government has sent to limit holders in the province a notice stating that the Government plans to pass an order-in-council making it obligatory on all persons lumbering along the right-of-way of any railroad to clear away and burn all tops and debris within 100 feet of the right-of-way. This is decidedly a progressive step which will have hearty and general support. It imposes no very heavy expense on any party concerned and provides a valuable protection for the adjacent woodlands.

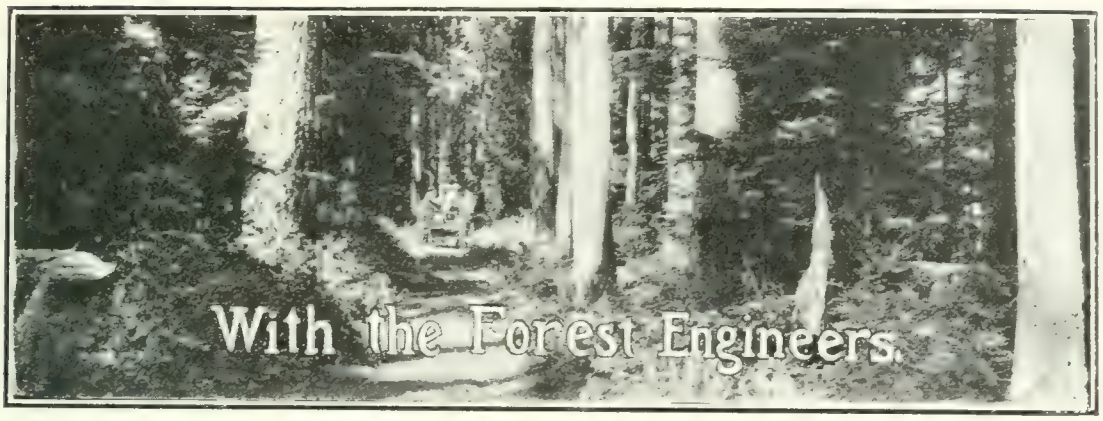
AN ONTARIO REMINDER.

The Ontario Department of Lands, Forests and Mines has issued recently for the use of lumbermen, loggers, tourists, settlers, railroad construction gangs, boy scouts, etc., a handy pocket whetstone neatly mounted in enamelled metal. On the enamel is printed in bold letters: 'Prevent Forest Fires—When in the woods put your campfires out. Do not drop lighted matches or tobacco." This is likely to prove very effective as a constant reminder to thousands who come in contact with the forests.

SAP CUP BURIED IN TREE.

Mr. Avern Pardoe, a well-known stock broker of Toronto, writes this interesting note to "American Forestry":

"I was cutting a large white pine, about three feet in diameter and 150 feet high, when about a third of the way through the ax went into what I thought was rot. The remainder of the cut was made with the saw. We then found the supposed unsoundness was in reality a cup cut into the tree when it was young and subsequently overgrown with new wood. There were over eighty rings of new wood outside the cup and about seventy rings had been formed before the cup was made. It was undoubtedly Indian work as eighty years ago there were no white people in the district. The purpose of the cut must have been to gather gum for the making and mending of canoes, etc. The place was the shore of an island in Lake Joseph in the Muskoka district, Ontario, Canada."



Messrs. E. G. McDougall, C. S. Cowan and L. R. Andrews, of the British Columbia Forest Service, have enlisted.

Mr. Ellwood Wilson, Chief Forester of the Laurentide Company, has been elected a member of the Society of American Foresters.

Mr. G. C. Piche, Chief Forester of Quebec, has planted a thousand trees on his estate at Burrill's Siding.

Mr. W. J. Boyd formerly of the staff of the District Inspector of Forest Reserves, Calgary, has enlisted in the Third University Company, Montreal.

Mr. T. W. Dwight, Assistant to the Director of Forestry, Ottawa, has returned from an inspection trip through the West.

Mr. R. H. Campbell, Director of Forestry, left Ottawa on July 15th for his annual inspection trip covering the Forest Reserves and much of the outlying territory now patrolled by rangers of the Forestry Branch.

Mr. R. K. Shives, a forestry student lately in the employ of the New Brunswick Railway Company under Mr. R. R. Bradley, has joined the aviation corps training at Toronto.

The number of forest guards already appointed in British Columbia and assigned to fire service amounts to about 150 in addition to the permanent staff of 38 rangers. As the season advances it is expected that thirty more guards and probably fifty or sixty patrolmen will be added.

The nursery work and plantations of the Laurentide Company at Grand Mere, P.Q., were visited by Mr. G. A. Gutches, head of the New York State Ranger School at Wanakena. It is the intention of the Laurentide Company to conduct experiments in the disposal of logging debris by burning along the lines advocated by Mr. Gutches.

Mr. H. R. Christie, Assistant Chief of Operation, British Columbia Forest Service, is making an extended trip of inspection in the northern forest districts conferring with District Foresters Murray, Bonney, Marvin, Allen and Irwin. He reports that while there was a short spring fire season heavy rains have made the north country safe for the present.

A MESSAGE FROM AFRICA.

In a letter just received by an Ottawa friend from Mr. A. E. Gower, District Forest Officer of the Union of South Africa, stationed at Fort Cunynghame, Toise River, the following paragraph appears:

"The 'vim' that is apparent in your Dominion in all matters pertaining to Forestry, protective and utilitarian, is much appreciated by other forest officers far removed from the centres we read of, and one can but hope that South Africa will, at a not too distant date also have her illustrated journal."

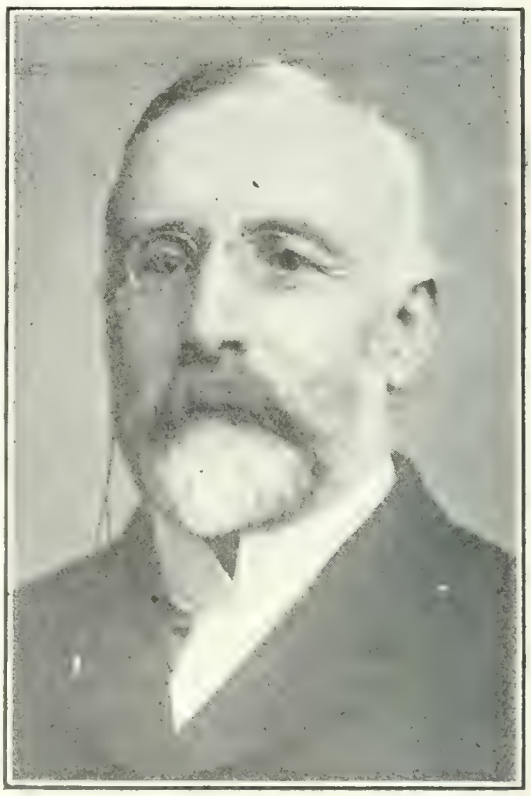
EXCHANGE CUT-OVER LANDS.

A plan has been suggested by Elmer Cox, of the Madera Lumber Co., San Francisco, regarding an exchange of cut-over private lands for timber located within the National Forests. Mr. Cox believes that it would be practical for a bill to be enacted which would allow private holders to make application to the Government for an exchange of cut-over lands based upon their availability for reforestation. If a mutually satisfactory basis of exchange could be reached, the Government would impose such regulations in regard to private cutting as now obtains in the National Forests, to insure satisfactory reforestation as a pre-requisite of the exchange.

Death of Mr. Aubrey White, C.M.G.

Mr. Aubrey White, C.M.G., Deputy Minister of Lands and Forests for Ontario, died suddenly, of the rupture of a blood vessel in the head, at his summer home in Muskoka on July 14. Mr. White was taking a brief holiday and the fatal attack occurred in the evening of the 13th after he had been spending the day in the open air in the woods and on the lake, and he died early the following morning.

Mr. White was born in Omagh, County Tyrone, Ireland, on March 19, 1845. He came to Canada at the age of seventeen and did pioneering work in Muskoka from 1862, later getting into the lumbering business in that district. He entered the service of the Ontario Government as a forest ranger in 1876, and so in the course of his term of just about forty years he had passed through all gradations of the service from the lowest to the highest. He was appointed Crown timber agent at Bracebridge, Muskoka, in 1878 and two years later was brought to Toronto as Chief Clerk of Woods and Forests. These were formative years in the Department and in 1887 he became Assistant Commissioner of Crown Lands, which office later was entitled that of Deputy Minister. This was the post which Mr. White held at the time of his death, having been the administrator and confidential adviser of sixteen or seventeen ministers and five Governments, including a change from Liberal to Conservative administration. Probably Mr. White's greatest individual achievement was the establishing in 1885 of the fire ranging system, the first on the continent and which after thirty years' development now covers northern Ontario with a force of rangers at a cost of about $250,000 per year, exclusive of the amount paid out by lumbermen in patroling their limits. But what many regarded as



The late Aubrey White, C.M.G.

of equal or greater importance was Mr. White's daily supervision, year after year, of the determining and collecting of Ontario's forest revenue which has ranged between $1,750,000 and $2,000,000 per year.

Mr. White took a very deep interest in the work of the Canadian Forestry Association and attended its conventions whenever his duties permitted and participated actively in the discussions. When the early history of the Association comes to be written Mr. White will be named as one of the gladiators who contended in the effort to arrive at the best plan of advancing forest conservation. He held strong views and championed them ably. He was elected President of the Association for the year 1904-5 and presided at the annual meeting in Quebec in March, 1905. He was for two years Honorary President and for several years past had been one of the directors of the Association. He was al-

ways very keenly interested in its work and never too busy to give his counsel when asked by officers of the Association. His death leaves a gap in the ranks that it will be difficult to fill.

Mr. White's business interests and cares were practically confined to his official duties. In religious life he was an Anglican and for many years he was one of the chiefs of the Masonic Order, attaining the office of Grand Master of the Grand Lodge of Canada in the year 1911-12. He is survived by his widow, one son and four daughters. In social life he was a delightful acquaintance and a firm friend and the Canadian Forestry Association is but part of that wide circle which will keenly feel his loss and which offers its sympathy to the members of his family.

Forest Products Laboratories

(*Continued from page 117.*)

been tested in commercial sizes in the large machines. Much valuable information has been obtained from these tests and results will be ready for publication in the near future.

Timber Physics.

Considerable equipment, including microtome, microscopes, photomicrographic apparatus, projection lantern, cameras, electric ovens, autoclave, balances and so forth, has been obtained for this division. The work has to do largely with the determination of physical and structural properties of wood by the testing of moisture content, specific gravity, percent springwood, percent summerwood, percent sapwood, percent heartwood, fibre dimensions, cell structure, microscopic characteristics and fungus infection. There has been considerable study to learn the relation of microscopic structure of wood to penetration by preservatives and other liquids. General botanical studies are also made. All the photographic work is done by this division, including the making of microscopic slides, photomicrographs and lantern slides of wood sections and pulp fibres, as well as miscellaneous photographs, copies, enlargements, etc. Studies have been made to improve the methods of wood identification. Investigations are in progress on the relation of vapor pressure and shrinkage to the moisture content of wood.

Pulp and Paper.

Special attention has been given to the equipping of a thoroughly modern semi-commercial experimental papermill and it is safe to say that when all the equipment is in place this mill will be without an equal in any of the centres throughout the world where experimental work of this kind is in progress. A special Fourdrinier paper machine has been installed, the machine being about 75 feet in length and turning out a sheet 30 inches in width. The machine is flexible in its adjustments and attachments and is designed to make practically all grades of paper. A single beater of 40 lbs. capacity and a double beater of 60 lbs. capacity have been installed with interchangeable basalt lava and steel rolls with individual motor drive to each roll. The remaining equipment, which is now in place, includes three stuff chests, riffler, screen, four pumps, five motors, two paper testing instruments, Erfurt sizing system and a variety of small apparatus. Sulphite and soda digesters and other equipment will be installed in the near future for the manufacture of wood pulp by chemical processes on a satisfactory scale. Preliminary work has been done on several pulp and paper investigations. Queen's University has co-operated in research on the chemical composition of waste sulphite liquor, which is produced in such large quantities by our papermills.

Wood Preservation.

A new Division of Wood Preservation was organized in October, 1914. The scope of this division includes the study of wood preservatives and methods of treating wood to prolong the life of railroad ties, paving blocks, telegraph poles, posts, piling, trestle timber, mine props and structural timber in general. A study of wood destroying fungi has also been undertaken as well as methods of fireproofing wood. A certain amount of equipment in the form of retorts, pumps, motors, air compressor and so forth have been obtained for the carrying on of experimental work. Particular attention is being paid to the subject of railway ties in Canada.

Proposed Divisions.

Although it is not feasible to establish more than the four above-mentioned technical divisions at the present time there are a number of other branches of work in the field of forest products which demand attention and which should be taken care of in separate divisions some time in the future. There are decided limitations to our accommodation and facilities for experimental work in the present temporary quarters and provision for new divisions is somewhat uncertain until we have a new and fully equipped building.

A study of the lumber industry with special reference to sawmill operations and waste wood utilization is perhaps the most pressing of these needs. Since lumber is by far the most important of our forest products it is clear that there should be made a special study of this industry from beginning to end. The technical assistance which these laboratories might give to the industry would be partly in carrying on direct investigations but probably more in suggestng improved methods of operation and utilization of waste.

A Division of Chemistry would provide for experimental work on the recovery and refining of essential oils, turpentine, rosin, tannins, dyes, potash and other products from the leaves, branches, bark, trunk and roots of trees of various species.

Destructive distillation of hard and soft wood has attracted considerable attention in Canada. The hardwood industry now provides large quantities of wood alcohol, acetic acid, acetone and charcoal. It is interesting to note that wood alcohol is now in great demand for the manufacture of formaldehyde to disinfect the trenches and hospitals at the front, while acetone is necessary in large quantities as a solvent for gun cotton in the manufacture of cordite, which is the explosive used in shrapnel and rifle cartridges. An investigation is now in progress to study the possibilities of resinous wood distillation as applied to Western Yellow pine stumps in British Columbia. The products of this process are turpentine, pine oil, light oils, pine tar oil and charcoal, together with a variety of secondary products. These laboratories have been of assistance in a general way in promoting these industries.

The hydrolysis of wood for the production of sugar from which ethyl alcohol (grain alcohol) can be made and the use of the wood residue as cattle food are discoveries of recent years which give promise of important industrial development in the future. At present the laboratories are unable to do any experimental work along this line.

The investigations made by the laboratories are regulated by an Advisory Committee of seven members who represent a wide range of experience and interest.

The members of the staff are called upon from time to time to give lectures before scientific societies, university students or the general public and a good deal of interest has been stimulated in this way.

The publications contributed to date by the laboratories are Forestry Branch Circular No. 8, "Forest Products Laboratories," Circular No. 9, "Chemical Methods for Utilizing Wood Wastes" and Bulletin No. 49, "Treated Wood Block Paving."

An important function of the laboratories has been that of answering inquiries on forest products. In this way the laboratories have undertaken to act as a bureau of information for the benefit of the public.

The laboratories are co-operating as far as possible with various industries, railways, universities, societies and individuals. In fact the use of wood is a subject which is so extended and varied that the problems can only be solved by the united efforts of all who are concerned. It is a mistake to think that the Forest Products Laboratories can, in some mysterious way, bring about a new era in the wood-using industries and by a wave of the wand transform all our wood waste into products of great value. This is a slow process which can only be brought about by faithful and systematic work and the gradual introduction of scientific methods into industry. The co-operation and interest of everyone engaged in the handling of wood and its products is necessary if Canada is to maintain a high place among the nations in the proper utilization of her forest resources.

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Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6x25. Air goods for home, camp, yacht, canoe, etc.

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Publicity--The Right Arm of Forestry

"Public education is the chief measure of progress in forestry.

"This is not conjecture. It has been proved. Progress differs locally almost exactly with the degree in which propaganda has been skilful.

"To get a large proportion of our population interested in forest affairs we should adopt methods that experience has proved most effectual in getting its interest in anything else.

"Why devote a forestry convention to discussion of needed laws and practice and go home with no more knowledge of how to make your community let you apply them?"

—(*From report of Sub-committee on Publicity, Fifth National Conservation Congress, Washington.*)

Publicity is perhaps the strongest weapon which an institution such as the Canadian Forestry Association may wield. Conventions, generating a peculiar power as they undoubtedly do, fail to duplicate the twelve-months' power of newspaper and magazine publicity. Where ten Canadians come within the influence of a convention, ten thousand may be linked to forest conservation through the printed page. This fact is now generally recognized by all United States associations having aims similar to our own. It is the function alone of the newspaper and the weekly and monthly magazine to take the wisdom and zeal of the assembly hall, the arguments and prophecies of foresighted citizens, the truths demonstrated by expert foresters and scatter them along the country concessions and thrust them into the hands of the most inert dweller of town and city. Twelve-months-in-the-year publicity can multiply a single voice until it talks to a continent.

During the months of May, June, and the first part of July, Canadian editors have generously co-operated with the Secretary of the Canadian Forestry Association in publishing about thirty special articles, many of them well illustrated.

These publications include, among others, Industrial Canada; Maclean's Magazine; Monetary Times; Western Lumberman; Canada Lumberman; Busy East; Farm and Dairy; Canadian Pictorial; Farmers' Advocate; Montreal Herald; Montreal Gazette; Montreal Witness; Toronto News; Ottawa Citizen; Ottawa Free Press; Ottawa Journal; the Wilson Syndicate, and many more, including several young people's publications such as 'East-and-West' and 'Onward,' official papers of the Presbyterian and Methodist Sunday Schools. Titles of articles included 'The Forests and the Fire Thief'; 'Forests and Water Powers of Ontario'; 'The Tragedy of Misused Lands'; 'Campers and Forest Fires'; 'The Fight to Save the Forests'; 'The Woodlot—A True Friend of the Farmer'; 'Do the Forests Hold the Key to Maritime Prosperity?'; 'Fake Settlers and Forest Fires'; 'The Problem of Settlers' Slash', etc., while the articles in the children's magazines dealt with the work of the forest ranger, how fires are fought, what damage is done and who pays for that damage, all such contributions being brightened with photographs.

Particularly gratifying has been the assurance of numbers of influential Canadian editors that they stood ready to co-operate with the Canadian Forestry Association in disseminating knowledge of forest problems and helping towards a public awakening.

TENDERS FOR PULPWOOD LIMIT

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway, west of Lake Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into paper in the Province of Ontario—the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

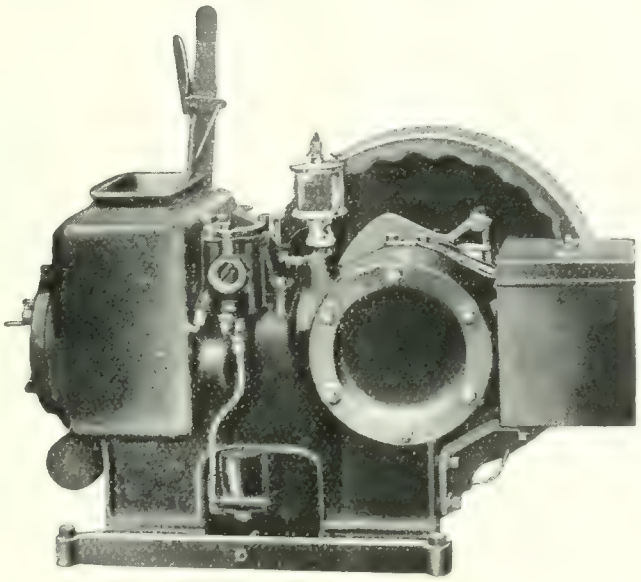
For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,

Minister of Lands Forests and Mines.

Toronto, June 5th, 1915.



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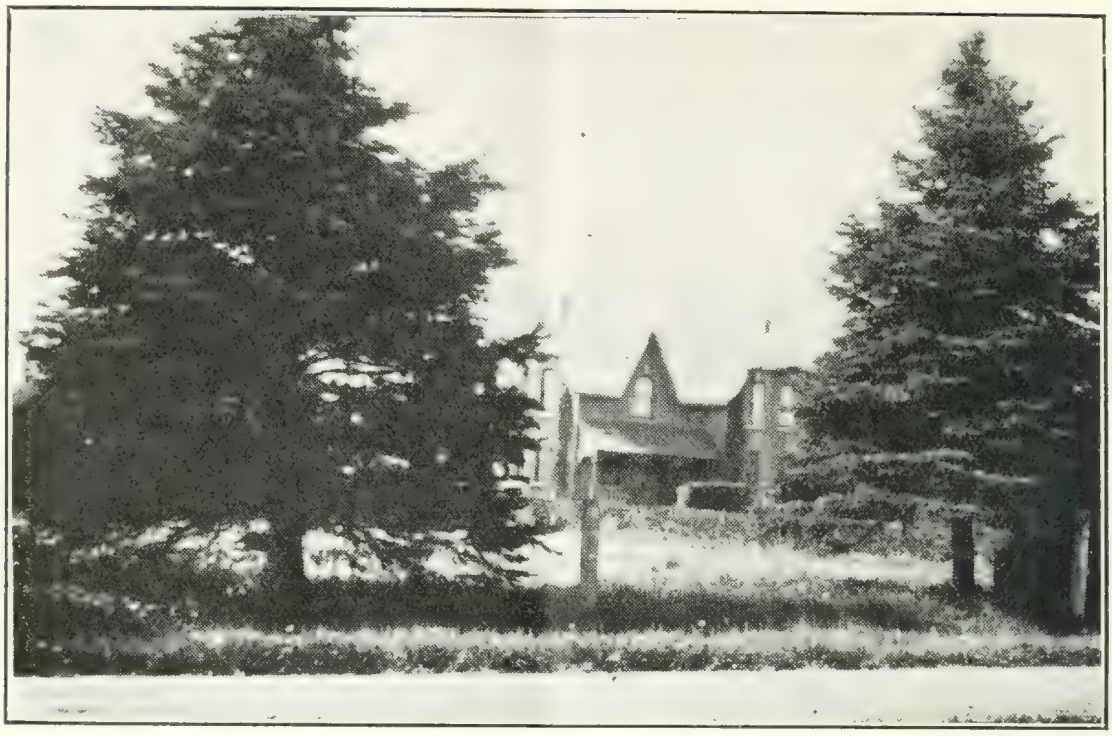

Evergreens Are Beautiful at All Seasons.

Mr. Fred. Forward, Dundas Co., Ont., has used evergreens both for highway planting and for hedges bordering the lawn. In both places they are ornamental twelve months each year.

—Photo by an editor of "Farm and Dairy," of Peterboro.

Try This Stump Puller at Our Risk

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JUNE ISSUES WANTED.

The Editor of the Canadian Forestry Journal would be greatly obliged if members having on hand copies of the June issue would send them to the Journal office. The June number was practically exhausted and extra requests make it desirable that several hundred additional copies should be secured from members as soon as possible.

TREES, SHRUBS AND SEEDS
Hardy Northern Trees and Shrubs at Forest Prices. Native and Foreign Tree Seeds
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LIST OF LATEST BOOKS ON FORESTRY.

Supplied Through The Journal's Book Department.

Chapman's
FOREST VALUATION.

By Herman Haupt Chapman, M. F. Harriman, Professor of Forest Management, Yale University Forest School.

This is the first book in English that treats this subject in a sufficiently clear manner. Includes stumpage, damages, values and costs of forest production. Has been treated in a style that can be readily grasped by the average reader. 284 pages, 6 x 9, cloth, $2.00 net.

Record's
MECHANICAL PROPERTIES OF WOOD.

By Samuel J. Record, M.A.M.F., Assistant Professor of Forest Products, Yale University.

This book is divided into three parts as follows:

Part 1. Fundamentals, considerations and definitions, strength and toughness, etc.

Part 2. Factors affecting the mechanical properties of wood.

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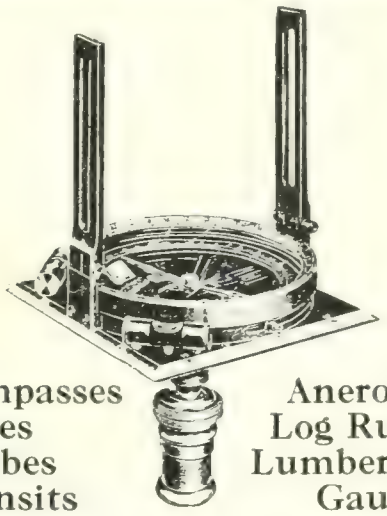

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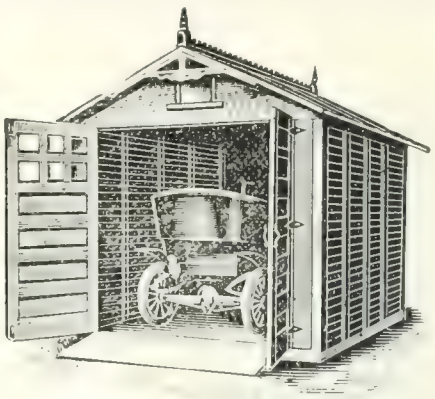

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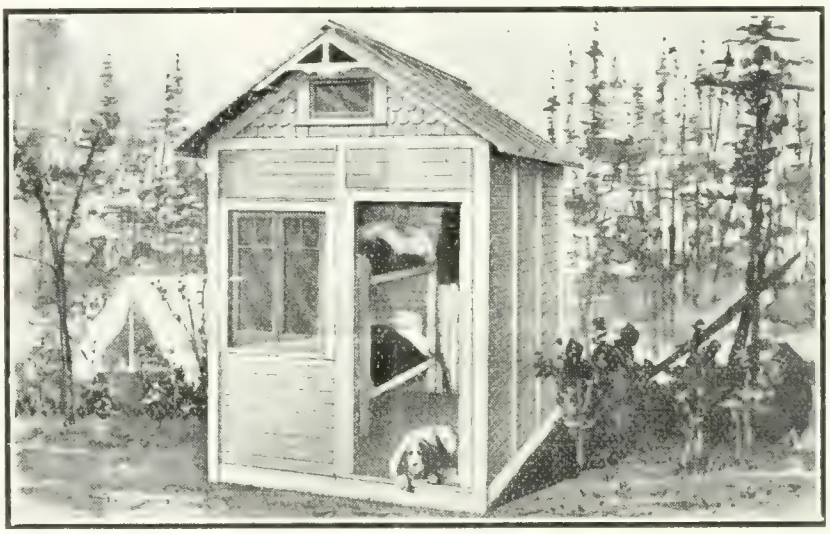

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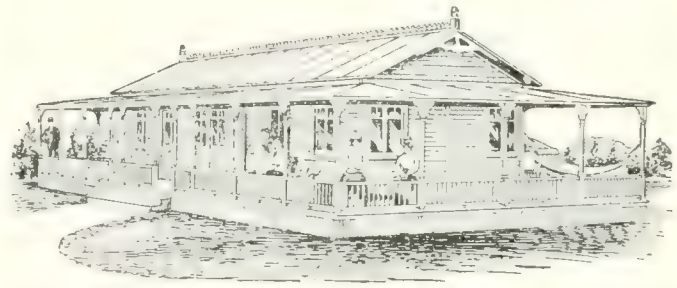

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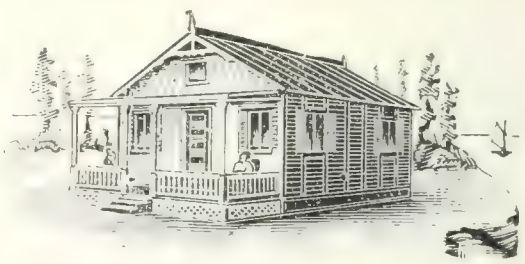

EX-GERMAN SHIP FOR B. C.

The British Admiralty have agreed to turn over to the British Columbia Government, for one voyage from the Coast to the United Kingdom, the steamer "Grahamland," now at the Falkland Islands. The "Grahamland" has an interesting history, having been, until the destruction of Admiral von Spee's squadron, the German collier "Josephena," when she surrendered to one of the British warships.

The ship was offered through the Agent-General, to the British Columbia Government for the transport of a lumber cargo to the United Kingdom, not necessarily for admiralty purposes, and this being so, all timber shippers were notified and asked to make offers for the vessel, the amount of the charter being £6,600. The bid of the Cameron Lumber Company, of Victoria, was accepted, and the "Grahamland" is expected to arrive for August loading. Her capacity is given as 550 standards equal to 1,100,000 feet, and the securing of such a vessel at a time when tonnage is scarce by a British Columbia firm even at such a high figure is a matter for congratulation. It is hoped that the "Grahamland" will not be the last of the captured or interned German ships to be utilized in the lumber carrying trade from Canada.

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The students of the Quebec Forestry School have been extending their studies at Burrill's Siding, on the estate of Mr. G. C. Piché, Chief Forester of Quebec. The students will very soon have the use of a new building which the Department of Lands and Forests is building at the Government Nursery at Berthierville. The plans indicate a fine structure.

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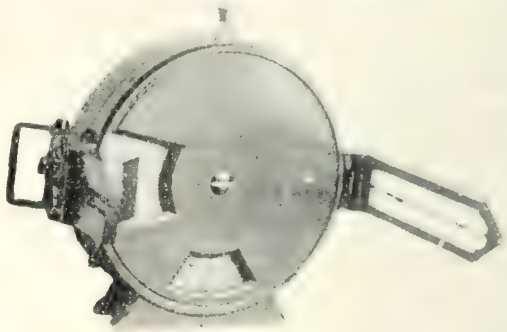

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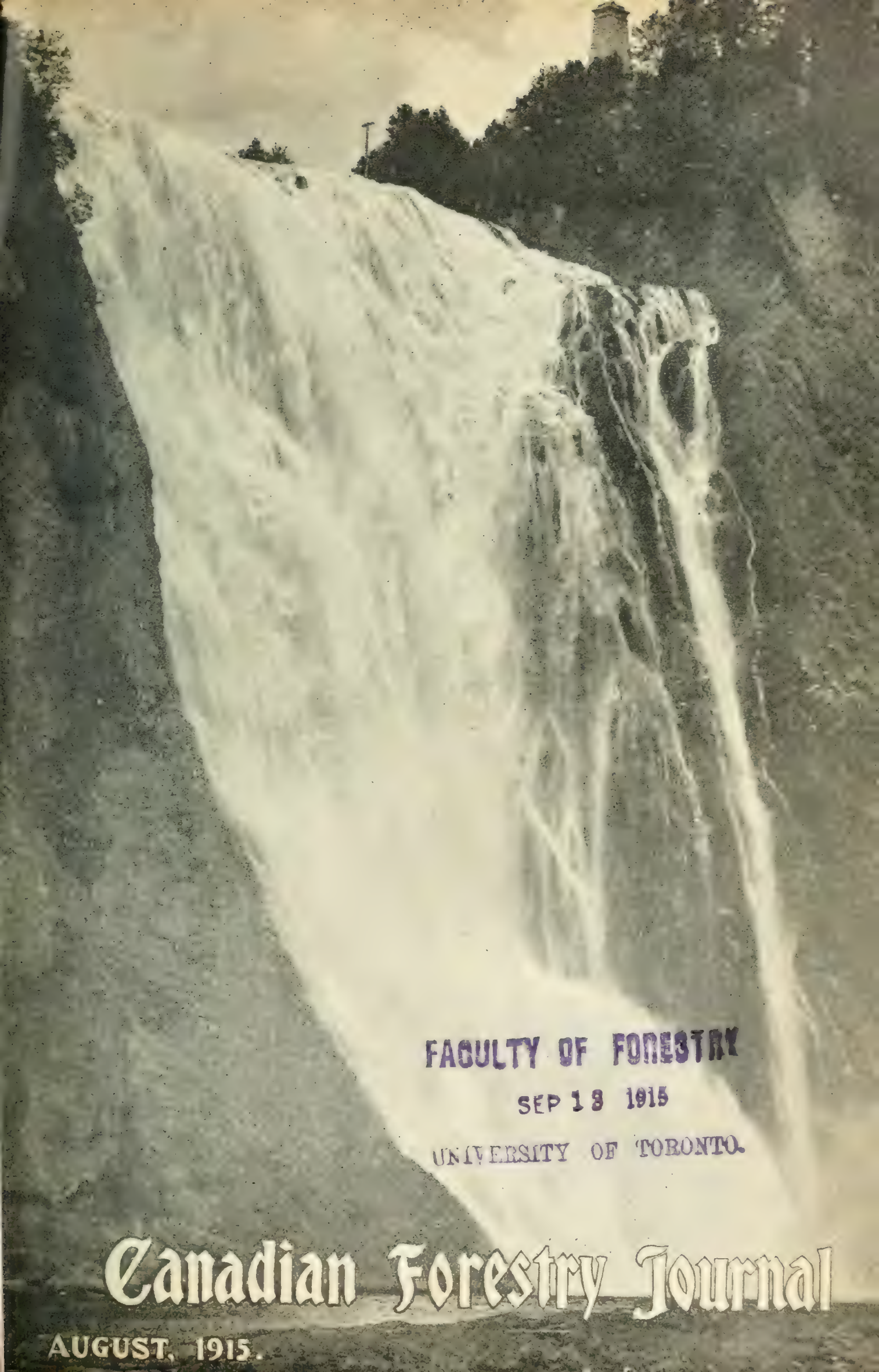

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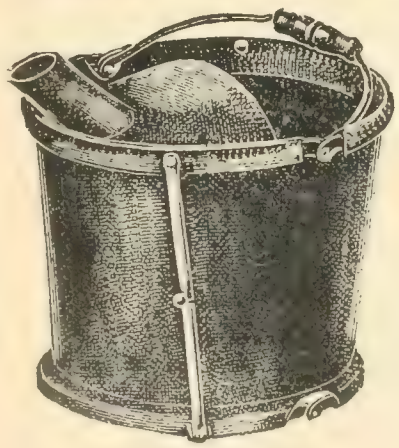

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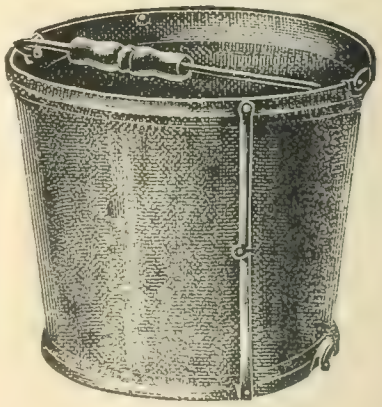

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Canadian Forestry Journal

VOL. XI. OTTAWA, CANADA, AUGUST, 1915. No. 8

Plantation of White Pine and Scotch Pine made in 1911, by the provincial forest service, on the sand dunes near Lachute, P.Q. This work will stop the shifting of the sand by wind and the consequent destruction of valuable farming lands through being covered with sand.

Putting Useless Land To Work

How the Quebec Government is Planting Up the Lachute Sand Plains—A Visit to Berthierville.

Wherever the question of reforestation is discussed, the experiments conducted by the Quebec Government at Lachute are invariably a subject of deep interest. Recently the editor of the Forestry Journal was given an opportunity of visiting the Lachute plantations in company with Mr. G. C. Piche, Chief of the Forest Service of Quebec Province, Mr. Clyde Leavitt, Forester to the Commission of Conservation, Mr. Ellwood Wilson, Superintendent of the forestry division of the Laurentide Company, and Mr. Henry Sorgius, Manager of the St. Maurice Valley Forest Protective Association. No argument is needed to prove the practical success of the plantations. The results are in plain sight. Every year of its operation will more and more justify the

faith of Department of Lands and Forests in this excellent undertaking.

Farmers May Buy Back.

The land which is being gradually reclaimed to its original service of tree growing is on the north shore of the Ottawa, some 44 miles from Montreal and 76 from Ottawa. On one section of a thousand acre patch of abandoned sand plain are located the Government plantations, now about forty-five acres in extent. The Government already owns 350 acres which were bought from farmers at a dollar an acre, the former owners being assured of the privilege of buying back the land at the end of fifteen years at $10 an acre, although with no right to strip off the young timber which will then be upon it.

Sand Drifts a Menace.

At the present time these thousands of sandy acres near Lachute represent absolute waste and look the picture of desolation. More than that, they are a grave menace to surrounding fertile land and in the past twenty years or so under the influence of winds have extended their area to a degree which finally alarmed the nearby farmers and hastened action by the Department of Lands and Forests. Local records indicate that about one hundred years ago the destruction of forest growth commenced. Farms came into being and gave very good crops until perhaps half a century back. Evidence that the ground was gradually petering out became apparent, but the conclusive blight upon the district arrived with a plague of grasshoppers which cleared off practically all green vegetation. The recurrence of the plague for several seasons settled farming prospects of dozens of families. Sandy drifts began to appear and with the increasing winds soon widened the gaps between fertile or semi-fertile patches. To-day there is not a dollar's worth of cereal or fodder raised on thousands of acres.

Neighboring Tree Growth.

Under such circumstances, the Department of Lands and Forests established the plantation. The first object was to bring about a fixation of the sand, the second to put the useless area under a useful crop by the planting of trees. Farmers of the district had done some haphazard planting and secured surprising results. There was also the neighboring example of Oka, where the Sulpician monks had performed a feat of reclamation and reforestation many years before under conditions not very different to those at Lachute.

The soil at the Lachute property is sandy but with abundant moisture a few inches below the surface. On the edges of the sand fields some trees of good proportions are found growing, such as white pine, tamarack, balsam fir, white spruce, white cedar, balsam poplar, aspen poplar and white birch.

The trees going into the plantation have been brought from the provincial nurseries at Berthierville and consist of a variety of conifers, such as white spruce, Norway spruce, white pine, tamarack, bull pine, Scotch pine, with a scattering of green and white ash and elms. They were planted four years ago and are seven years from seed. Mr. Piche, who had special charge of the planting work, utilizing the students from Laval forest school of which he is a director, placed the young trees five feet apart each way and achieved the good average of 1,500 trees per day per man. Careful study of the situation convinced Mr. Piche that in the parts of the plain subject to heavy winds, and therefore heavy drifting, the trees must be preceded by some treatment of the surface and to this end he adopted the use of beech grass. French government experiments with beech grass had accomplished fine results in the sand

dunes of Brittany, and elsewhere, results which were personally known to the Minister of the Department and Mr. Piche. Long furrows were ploughed and seed stalks, from a neighboring field of beech grass, strewn along the bottom. These sprouted in long rows and with their faculty of sending back suckers will gradually cover the space between the rows and thoroughly fix the sandy surface. When this is even partially accomplished, trees will be planted. In time, the trees kill out the beech grass after it has served its important purpose. The condition of the beech grass at the present time indicates a vigorous growth. Already the rows, though comparatively thin, have acted as a barrier to drifting and in a year or two will likely have stopped it altogether.

Beach Grass planted by the provincial forest service of Quebec upon the sand dunes near Lachute. In a few years the ground will be well covered and the shifting of the sand by the winds will have stopped at which time trees will be planted. The idea has been tried out with great success in France.

Sixty Percent Survive.

As for the trees, about sixty per cent. have survived the test of the first few years' struggle. This year, since the plants have secured a firm root grip, the growth has been in some cases phenomenal. One white spruce displayed a leader which measured thirty-one inches, and twenty-five inches was not at all unusual in many parts of the plantation. As a whole they looked in first-class condition and will undoubtedly develop quickly with the abundance of moisture which the soil provides. Even the rows which have attained in places only ten or twelve inches in height are effectually holding the sand and each year's growth will add to their value in that regard.

The Province has gone to some considerable expense to make the plantation what it is, but even the most casual onlooker must recognize the hard-headed business sense of all that has been done. Had the plains been left as they were, forty years hence would not only find them in more wretched condition but miles

of good land in the vicinity would have been overflowed by the restless action of the sand. Given over to tree growing, forty to sixty years will produce a highly valuable timber forest, every tree of which will be an almost clear addition to the provincial wealth. The neighboring farms will be materially improved by the presence of the forest and the town of Lachute may very easily add to its prosperity by one or more sawmills. Long before the time for cutting lumber, there will be a steady production of pulp trees for the market, and an abundance of fuel wood.

New Building for Students.

The Berthierville Nurseries to which the Department is devoting much attention show many improvements over previous years. A handsome building to be used as a summer forest school by the students from Laval is nearing completion and will give excellent accommodation. Extensions have been made to the size of the nurseries and Mr. Piche has comprehensive plans which in a year or two will give them still greater value. The soil is sandy and clayish with good moisture and produces a quick and sturdy growth. Beds of pine of all Canadian species were in first-class condition and this year's growth was surprisingly vigorous. White and Norway spruce beds looked equally well. There should be enough stock at the Berthierville Nurseries to meet demands from all parts of the province. Together with the work at Lachute it indicates the practical and determined spirit in which the Minister of Lands and Forests and his various officers are attacking the problems before them.

Fire Patrol on Government Road

Negotiations are under way to have an efficient fire patrol established along the line of the National Transcontinental Railway passing through the St. Maurice Valley Forest Protective Association's limits between Herve Junction and Parent. The Journal understands that at a recent conference between Hon. Jules Allard, and representatives of the St. Maurice Association and other bodies, the Minister consented to assume on behalf of the Province a portion of the cost of the Government railway patrol, while the association of limit holders undertook responsibility for an equal share. Action by both parties depends, of course, upon a supplementary undertaking by the Minister of Railways. Recently, however, he made clear his willingness to give the Government lines crossing the St. Maurice limits fire protection equipment, such as speeder patrols, equal to the privately-owned lines. That the Minister will follow up his assurance by a specific agreement is confidently expected. In all probability the fire patrol on the railway —about 150 miles in extent—will be controlled by the St. Maurice Valley management thus making certain of economical and efficient supervision of railway and limits without any overlapping or conflict of authority.

From Herve Junction to the Western boundary of Quebec is a still greater stretch of the Government-owned road, traversing part of the territory under operation of the Lower Ottawa Forest Protective Association and the lines of the proposed Upper Ottawa association. This needs protection quite as urgently. Doubtless if the Herve Junction—Parent section is given a patrol, the balance of the provincial trackage will in time secure equal treatment.

Money Value of Shade Trees

Vandalism Must Pay a Heavy Price—Canadian Municipalities Awakening to a New Public Duty.

The changing views of Canadian municipalities regarding the importance of shade trees on the public streets is one of the most striking developments of recent years. Once in a while this development is given a picturesque illustration through the courts which thereby fasten upon the public imagination the meaning of arboriculture as no technical lectures or literature possibly could do. A construction company destroyed certain trees that obstructed its way on a New York thoroughfare and a few weeks ago was compelled to pay $500 for each tree and $1,000 additional for damages. A few years ago a decision of this kind would have created amazement: to-day the general sentiment strongly applauds the courts for such a sensible and courageous stand.

Twenty years ago a proposition was seriously placed before the Ottawa City Council that all trees on the streets should be removed. This monstrous notion was deliberated upon for some weeks before common sense prevailed. While the Councils of to-day would treat a similar suggestion as a madman's joke, it does not follow that vandalism in the matter of tree destruction is adequately guarded against. In practically all our towns and cities, the attitude of Councils is purely negative. Occasionally a town engineer makes recommendations in specific cases, but mostly the ruin or preservation of what are common municipal assets is left to the sweet will of individuals. In almost any municipal districts, one will discover cases of tree slaughter to 'show off' the architecture of a new building, although in doing so, the builder frequently violates the rights of surrounding property owners and the rights of the users of the thoroughfare. That trees on the public streets have a value recognizable in law has been put to the test so frequently in recent years as to drive home a much-needed lesson. Courts have gone so far as to declare that destruction of shade trees detracted from the value of an abutter's property to amounts running from $50 to $500.

Prof. T. J. Burrill, of the University of Illinois, cites the following instance of the money value of trees: "Two lots on the same street were offered for sale. These lots were essentially similar in all respects save that in one case there were four trees, about twenty-five years old. Two of these trees were in the street and two on the lot inside of the street. In the case of the other lot, the only trees (two of them) were on the street, and these were less than half the age of the others. The prices asked for the lots were respectively $2,500 and $1,500. A man wishing to build compared the two lots and decided in favor of the $2,500 one, the lot, namely, with the four trees—$1,000 for four trees, or we might say for two trees. This lot had sixty-six feet frontage and contained about one-fourth of an acre. On such an acreage the net profit for twenty-five annual crops of corn might perhaps have been $25. And each crop would have received more care than did the four trees during the whole of the twenty-five years. $1,000 to $25—the contrast is instructive. Yet

there are to-day persons of intelligence who, in looking forward to results, will prefer to trust the corn."

It is to be noted with satisfaction that the more influential Canadian newspapers are taking up cudgels in defence of the shade trees. In Toronto, Ottawa and Montreal, editorial comments upon the New York case cited above, we find such determined expressions as the following:

"People who are past the barbarian stage will applaud the decision, and in the interest of the public it should be given the widest possible publicity. It is a notorious fact that in most Canadian cities and towns trees are not held at a proper value. The other summer, the civic authorities in Montreal actually destroyed some of the most beautiful shade elms to make way for a monument, a bit of common vandalism that should have been punished with imprisonment.

"Here in Ottawa, we are blessed with some fine shade trees in our streets, but to anyone who takes the trouble to watch how they are being cared for it is evident that we could give them more attention than at present. Telephone poles and wires are often placed right beside some of the finest shade trees, to their inevitable detriment; and sometimes in opening new streets sufficient care to safeguard trees is not taken. It is a matter which might profitably engage more attention from the city authorities."

A Word for the Journal

(From "Printer and Publisher.")

"Poetic fancy has often personified the tree and given it the gift of speech. Something better than this fanciful voice is the very real publication, *Canadian Forestry Journal*, edited by the secretary of the Canadian Forestry Association of Ottawa. This modest but intensely interesting and efficient monthly is the forest's spokesman—clamant at times, persuasive at times, and always instructive.

Its mission is one of conservation. The contents of a recent issue indicate the purpose and scope of the *Canadian Forestry Journal's* business: Forest Fire Situation, Who Owns the Forest Lands, With the Forest Engineers, Problem of the Bark Beetle, Making a Fire-Proof Forest, Forest Management in Dominion Parks, Fire Protection on Railways, Sweden's Lesson for Manitoba, Experience in Pine-Planting.

Publishers of Canadian daily and weekly newspapers will find in this publication and in *Conservation*, a monthly bulletin published by the Commissioner of Conservation, Ottawa, much valuable material for special articles and editorials. Always the people's newspapers must be breakers and distributors to the multitude of bread which others provide."

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The progressive policy of the W. C. Edwards & Company, Limited, of Ottawa, has led them to construct a forest protection telephone line forty miles in length from River Desert to Tomasine Depot. Eventually the line will be carried to Lapine Depot in the Gatineau limits of the company, making a total of sixty miles. Twelve miles of the distance have been covered already and workmen are engaged upon the remainder of the line. This undertaking of the Edwards Company is of the highest importance to the work of forest protection in the Gatineau region and will greatly facilitate the efforts of the rangers maintained by the Lower Ottawa Forest Protective Association.

Mount Robson, the Giant of the Rockies, along the line of the Grand Trunk Pacific Railway.

Are European Methods Right For Canada's Forests?

What Can and Cannot be Adapted From Foreign Systems of Woodland Management.

By R. O. Sweezy.

Apparently there is no argument, however logical in scientific reasoning and aesthetic in its teachings, that can introduce European forestry methods into Canadian forests until, devoid of technical polish and romantic fervour, commercial profits commensurate with the necessary outlay and effort can be derived therefrom. Since European forestry methods, so called, have been fairly well explained and expounded to those interested in the welfare of Canadian timber lands it is unnecessary to further amplify them here. The question is, are those methods applicable to Canadian forestry conditions? the reference here being particularly to Eastern Canada.

Large timber limit owners and manufacturers of forest products in Canada rightly repudiate the French and German scientific methods as out of the question in our Canadian forests. It is not stubbornness on their part, nor yet lack of appreciation of what progressiveness and scientific effort can accomplish. It is purely a commercial consideration of dollars and cents.

Were Canada as thickly populated as Europe, her forests as accessible as those of Germany and France, labor as cheap, with the demand for wood as great and the price as high, then Canadian lumbermen and limit owners would be in a position to promptly adopt and improve upon every technical and practical method known to the world.

Labor and Transport.

To maintain the scientific culture of the forest as practiced in Europe requires, among other essentials, cheap labor and an intricate network of transportation systems, penetrating and surrounding the cultivated area. If Canada had such facilities and added to them—as in Europe—a profitable local demand for every twig that is pruned from the forest, then indeed conditions would be favorable for applying as much fostering care and maintenance as demanded by European scientific methods. But where have we such conditions in Canada? In the older inhabited parts of the country no doubt a modification of those methods may be applied on a modest scale, especially where ulterior benefits might be derived. Nowhere, however, does there appear to be a "commercial proposition" for the application of the principle of European forestry at the present time, except, of course, where the principle may be employed to reforest areas such as the Trent valley or on certain parts of the Prairie Provinces where the effort, not offering any inducement to private enterprise, becomes the obvious duty of the state.

But if the ultra practical Canadian lumberman rightly repudiates the European methods, what modifications, if any, should be profitably applied here? There may be varying opinions upon this point but we

all agree that fire protection is our crying need. We should, therefore, apply it in every imaginable and sane form.

A Clean Forest Floor.

France and Germany have perfect fire protection, or "fire proof" forests because of the cleanliness of the forest floor, accessibility to every part and the system of fire guards or open lanes.

To undertake a cleaning of our forest floors would cost as much as the commercial value of the timber lands for the under bush, dead falls and dry brush are so thick that an ordinary "bush whacker" will rarely exceed one mile an hour walking without a pack in the 'forest primeval.' Consider then how inflammable this under brush becomes in dry weather and how important it is—and how difficult—to check a fire that once gets a start therein.

If it is too costly to clean our forest floors there seems to be no economical reason why the other two European methods, viz., transportation facilities and fire guards, should not be employed at once in whatever measure we can, especially as the benefits sought begin to be realized with the expenditure of the first dollar, growing further in proportion to the amount expended and remaining as an asset that requires very little maintenance.

Mr. R. H. Campbell, in a recent number of the Canadian Forestry Journal has so succinctly and forcefully directed attention to the urgent need of transportation facilities and means of rapid communication within the forest that nothing further need be said on the subject except to ask any member who has not read Mr. Campbell's article on "A Fire Proof Forest" to do so at the first opportunity.

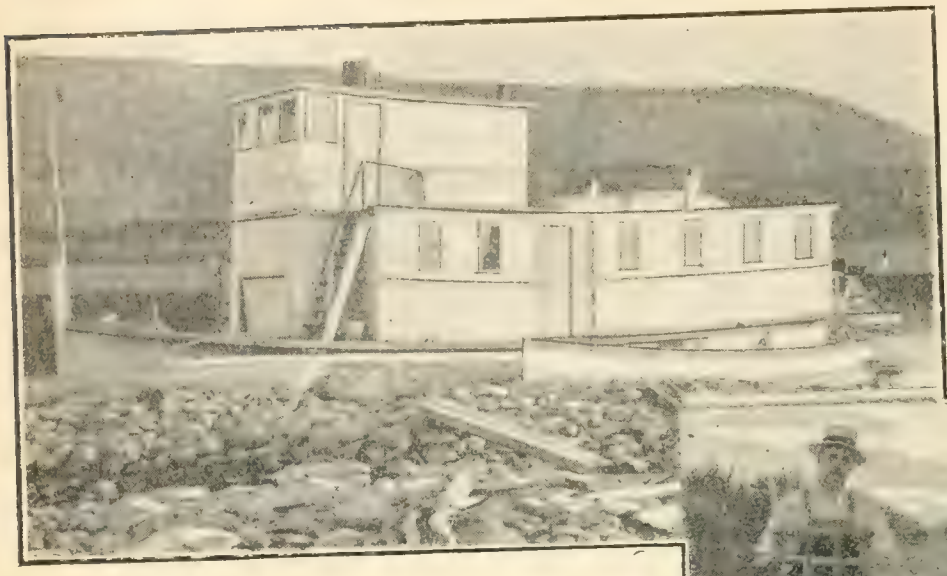
The question of establishing fire guards in our forests is not new nor dead, but was never thoroughly awakened. Mr. C. R. Coutlee, C.E., (member Conservation Committee, Can. Soc. C. E.), made one or two spasmodic attempts to awaken the interest of engineers on the subject of the urgency of cutting lanes through the forest so that bush fires once started could not go on licking up miles of timber 'ad infinitum.' Our haphazard method of opening up the country leaves enormous areas of forest with no fire cut-off except that offered by natural geographical conditions, which in Quebec—thanks to nature's lavish scattering of lakes,—have on scores of occasions saved the Province from such disasters as the Porcupine fire though not from devastating fires that have destroyed in a couple of days two or three hundred square miles of virgin forest.

Necessity of Lanes.

Taking advantage of geographical features, with a judicious selection of fertile strips, lanes can be cleared from lake to lake or lake to river, etc., and with government co-operation these strips, which should be about a mile wide can provide excellent farms which if found advisable could be owned by the limit owner, thus assuring care in burning of slash.

This system of farm lanes could be constantly extended gaining in efficiency. Nor would the system be dependent upon the completion of any elaborate scheme before its objects become effective, for each dollar spent in the work becomes immediately not only protective in sylviculture but productive in agriculture, furnishing products so essential in lumbering operations. The highways that must obviously be developed along these lanes would extend facilities of movement and transportation the lack of which is one great cause of retardation in adopting the more progressive and intensive methods of European forestry.

GUARDING THE FORESTS IN CANADA'S NORTHLAND.



A fire patrol boat on the Athabasca River, which renders excellent service.

Railway fire ranger following up a G.T.P. passenger train so as to detect incipient fires along the right of way.

Restoring South Africa's Forests

Ravages of Axe and Fire Have Left the Present Generation a Meagre Inheritance.

(Contributed to the "Canadian Forestry Journal")

Editor's Note.—Interest in South African problems has recently been stimulated by the picturesque events of Premier Botha's campaign against German authority in Southwest Africa. The following article gives a graphic picture of the troubles which beset a country when forest slaughter has been the custom of generations.

South Africa is comparatively a poorly timbered country and although fairly considerable areas of forest or scrub are known to have disappeared before the axe and fire within the last century or two, there appears to be no reason to think that it was ever, as a whole, a heavily timbered country during the present geological period.

There seems no ground for supposing that even scrub forests were found on the High Veld or Karoid Veld of the interior, while the same applies to a large part of the mountain slopes and the country between the mountains and the seas.

Roughly speaking the forests of this country may be classed as "dense timber forests" and "scrub forests," and the latter form by far the greater proportion. They cover

extensive areas known variously as "Thorn-veld," "Bush veld" or "Middel-veld," in addition to the "Low-veld" of Natal and the Transvaal. Numerous species enter into their composition, but various kinds of Acacias predominate. These trees sometimes reach a moderately large size, sufficient for sawing into timber, but over much of the more accessible areas where they occur, the mature timber has already disappeared. Generally speaking, the trees are of small size and slow growth, and their often scattered distribution and the open nature of the forests do not render the latter suitable for economic forest management. They are, however, an asset of much value for fuel, fence-posts and other local uses, as well as for shelter for stock and protection against soil-erosion. The land on which they are situated has mostly passed into private ownership or is situated within Native Reserves. Unfortunately the value of scrub-forests is often not realised by the owners and the destruction of them has proceeded ruthlessly in the past, and is still continuing to a large extent.

Scrub Forests.

In the category of scrub forests should be included the bushy growth found along much of the coast, a good deal of which has been set apart as Government Forest Reserves for the prevention of the formation of sand-dunes; and also large areas of forests in the Alexandra and other districts, where the trees, though of the species constituting the dense timber forests, are of dwarf size.

Data are not available to give even a rough estimate of the total area of the scrub forests. The area of Government Forest Reserves classified as scrub forests is roughly 120,000 acres.

Timber forests are found only on the seaward slopes of the mountain ranges within usually less than 100 miles of the coast, and at widely scattered intervals from the Cape Peninsula in the south-west to the Zoutpansberg Mountains in the north-east. Even on the mountain ranges where they occur, they seldom occupy any extensive area continuously, but are almost always found in isolated patches of from a few acres up to a few thousand acres each, in the "kloofs" or ravines.

Virgin Timber Rare.

In the Midland Conservancy, Cape Province, the largest more or less continuous areas of forest are found within a strip of country some 110 miles long and 10 miles broad, between the Outeniqua Mountains and the sea, extending from George through Knysna to the Humansdorp Division. It has been estimated that roughly 120,000 acres of this country are occupied by forests. These have been heavily exploited during the last century or more, and the "virgin" timber in them is approaching exhaustion.

In the Western Conservancy, Cape Province, from George westward to the Cape Peninsula, scarcely anything remains of the forests which were once found on the mountains, and which were exploited from the earliest days of white settlement in South Africa. They were allowed to be destroyed by fire, and small patches of forests remain only in the more inaccessible kloofs.

In the Cedarberg mountains, north of Cape Town, a distinct type of forest occurs, viz.: that of the Clanwilliam Cedar. This species does not form continuous forest, but the trees grow singly or in small groups, scattered on the rocky slopes and crags. The wood is, perhaps, the best of all South African timbers, being a durable light soft-wood, and the larger trees in all the more accessible parts have long disappeared before the axe. Since the area has been made a Forest Reserve, what is possible has been done to protect it from fire and to assist regeneration.

Over Exploited.

Eastern Conservancy, Cape Province.—The timber forests occur chiefly on the Amatola and Perie Ranges, but nowhere cover continuous areas of any great extent. These forests have been largely exploited in the past, and few of them still contain any quantity of virgin timber.

Transkeian Territories.—The timber forests here are, in general, similar in distribution and composition to those of the Eastern Province, but somewhat extensive forests occur at intervals along the coast.

Some of the more accessible of the Transkeian forests have been heavily worked in the past, but many of them, including most of the coast forests and some fine forests of nearly pure Yellow-wood in the Northern part of the Territories, have been too inaccessible to allow of profitable utilisation.

Forests of Natal.

Natal.—The forests of Natal are now of small extent, the greater proportion of those which once existed having passed out of Government ownership or been included in Native Locations, and much of the area once occupied by them has been deforested. Generally speaking, they may be grouped as mountain and coast forests like the Transkeian Forests, and are of more or less similar composition. A special feature of some of the coast forests is the large proportion of Waterwood, a comparatively light, easily worked wood.

Some of the Crown forests have been heavily worked in the past but there are some well-stocked forests of virgin timber, largely Yellow-wood, still existent on the Reserves in the southern districts of Natal.

Transvaal.—The timber forests occur at widely scattered intervals on the mountain ranges along the eastern edge of the plateau from the Natal border northwards, and are of small extent, with the exception of some comparatively large and continuous areas on the easterly slopes of the Woodbush Mountains and, to a less extent, on the outlying Zoutpansberg Range, in the extreme north.

With the exception of a few thousand acres of still virgin forest in parts of these ranges, the forests have all been heavily worked in the past and little merchantable timber remains.

The area of the timber forests situated on the Government Forests Reserves forms by far the greater proportion of the total, but their combined area is only approximately 400,000 acres. The forests on private property, commonages and Native Locations probably do not bring up the total to more than roughly 450,000 acres.

Regeneration and Growth.

In many of the forests, particularly in those of the Eastern Province, natural regeneration is very deficient, but in others, as in those of Knysna and some of the Transkeian forests, it is more abundant. In the majority of the forests, when in virgin state, the proportion of trees of "pole" size was low and when exploitation of the forests took place in the past, little or no heed was given to the preservation of the young trees or to securing conditions favourable for natural reproduction. Often over-mature and rotten trees were the only trees left and even since the Forest Department has taken charge of the forests, it has often been necessary to leave such trees owing to their being unmerchantable, and to there being an insufficient number of immature trees to be left to preserve the forest canopy. Moreover, the young growth in many of the forests was continuously destroyed by Natives for the sake of hut-wattles, and grazing and fires have contributed to its destruction. Almost all the species of trees are of slow growth.

For all these reasons, it will be

seen that many of the forests are necessarily not in a normal condition and that, although it is not intended to allow the younger growth to reach the dimensions or ages of the virgin timber, a considerable period of time must usually elapse before there will be much mature timber available from them again.

The State Attitude.

Until 1876 no control or technical control was exercised over the Crown Forests of Cape Colony, but in that year a Department of Forests and Plantations was constituted, and in 1881 a Superintendent of Woods and Forests was appointed. In 1891 this post was abolished and the four Conservancies into which the Colony had been divided were thereafter administered independently by four Conservators, until in 1905 a Chief Conservator of Forests was again appointed.

In the Transvaal and Orange Free State, Forest Departments were constituted by the Crown Colony Governments as subdivisions of the respective Agricultural Departments, in about 1903. In Natal no settled policy was followed, but the post of Conservator of Forests was twice made and twice abolished, the administration of the forests being in the hands of the Director of Agriculture from 1908 onwards.

When Union took place in 1910 the four Departments were immediately combined under one Chief Conservator of Forests, and uniformity of administration has since been introduced.

In 1913 Parliament passed a Forest Act for the Union. This Act, which came into force on the 1st November, 1913, consolidates and amends the Forest Laws previously in force in the various Provinces comprising the Union; and relates to forest tenure, forest reservation, demarcation and the regulation and protection of forests.

The afforested area of the Government plantations on the 31st March, 1914, was 63,498 acres. The expenditure under this head during the financial year, 1913-1914, was £89,806. The cash revenue derived from the plantations in the same period was £29,252. These figures include those for the Railway Sleeper Plantations, the management of which is undertaken by the Forest Department, and also include the cost of raising transplants for sale to the public and revenue derived from this and from sales of seed, amounting to about £19,000.

Use of Vacant Land.

A good deal of the vacant ground included in the Forest Reserves is suitable for afforestation, and steady progress is being made with the latter at the rate of about 6,000 to 7,000 acres annually.

The earlier plantations are beginning to yield considerable returns from thinnings, but mature timber will not be ready for cutting for some years.

The Department also undertakes the reclamation of drift sands on the coast, where required, in addition to protecting the natural vegetation, with a view to preventing the formation of new drift sands.

To encourage the general afforestation of the country by tree-planting by farmers and others for purposes of shelter, wood for fuel and other local uses, ornament, etc.

With this object, the Forest Department disposes of forest trees and seeds at very low prices, and it is always ready to give advice as to the selection of species, methods of cultivation and so on. Its officers also give lectures at some of the Agricultural Schools.

During the financial year 1913-14, about 2,634,000 transplants were sold from the Government nurseries, and 581,500 were issued gratis to other Government institutions. By far the greater proportion of these trees was planted in the Transvaal and Orange Free State, on the treeless high veld.

What happens when hillsides are denuded of forests.

Photographs taken in desolated parts of China. Top picture shows effects of recent erosion as a result of deforestation—about three miles from Tsa Pu, Wu Tai District, Shansi. Lower picture was taken in the valley of the Sha Ho with the town of Tou-Pung and distant Granite-Gneiss Mountains, Chili Province, China.

Photos by kindness of Dr. George Otis Smith, Director of U. S. Geological Survey, Washington, D. C.

An Increased Membership

Good Response in Campaign to Strengthen Association. New Members in All Parts of Canada.

One month ago the Canadian Forestry Association began a campaign for new members. At the time of writing (the middle of August) the number of additions has been decidedly encouraging. Before the close of the month, it is anticipated that many more will have been won as active supporters of the cause of forest conservation.

The President's letter to the membership was a vigorous request for personal activity in the Association's interest. All that the members were asked to do was to secure one new adherent, a very simple task as scores have found during the past four weeks. Many showed their practical interest in the Association by meeting the President's request to the best of their ability. A Toronto enthusiast, who until recently was not recognized as a champion of the Association, secured by personal effort no less than five new members in ten days, while a Winnipeg member brought in four splendid recruits. If all members of the Association displayed equal zeal, a membership of ten thousand would not be an extreme anticipation.

When this issue of the Journal reaches its readers, the time will still be opportune for sending in a new name. Although the date of August 31st was set as the time for measuring up results, no member need hesitate to make his effort for a new addition if this appeal reaches him a few days after that time.

The widely-representative character of the Association's membership may be guaged by a list of nineteen new members which arrived in two succeeding days: Clerk, bank manager, civil engineer, sportsman, merchant, nurseryman, capitalist, student, farmer, court clerk, three manufacturers, barrister, insurance manager, and three newspaper owners.

Many of the letters accompanying the applications for membership indicated the high regard in which the work of the Canadian Forestry Association is held throughout Canada. A Montreal business man of large interests, in applying for membership, wrote: "I am very glad to have the privilege of becoming a member of the Canadian Forestry Association. This is a matter that both myself and my firm have always been keenly interested in, and anything we can do towards forwarding the interests of the Association will be a pleasure." No less hearty was the communication of a civil engineer: "As I have for many years been able to observe the actual wrecking of our great forest I am deeply interested in your work. I accept with pleasure the opportunity to become a member of your Association."

With such evidence of the growing concern amongst Canadians of all callings and classes in the sensible utilization of the country's forest wealth, it should be possible for the present membership of three thousand to double itself without any very exhaustive effort.

Sample illustration used in "Twenty Canadian Trees"—Eastern Hemlock, Leaf and Cone.

"TWENTY CANADIAN TREES."

Illustrated Booklet, Prepared and Distributed by the Association, Meets With Widespread Demand.

During the month of July, the Canadian Forestry Association issued a twenty-four page illustrated booklet entitled: "Twenty Canadian Trees," written by Mr. James Lawler, former Secretary of the Association. Four thousand copies out of a first edition of five thousand have been sent to all parts of Canada in response to an immediate demand. The booklet met with so much appreciation and elicited such kind comments from newspapers, weekly magazines, and individuals that several editions could be disposed of, were not the resources of the Association for this branch of work limited. Requests have come from barristers, school teachers, manufacturers, editors, and nearly every other class of Canadians, as well as from scores of school-children, for one or more copies. An effort is being made by the Association to have the booklet given further circulation by the co-operation of local school boards. A few excerpts from the newspaper comments were as follows:

Hamilton Times: "The Canadian Forestry Association, which is doing a good work in preserving the forests of Canada and promoting their extension, has just issued a booklet giving a brief description, free from technicalities, of our most common and most important trees." The Times' entire reference occupies a column.

Canadian Courier: "A copy slipped into the pocket of a sport coat and produced on a first vacation ramble would supply considerable instructive entertainment."

Toronto Daily News: "A useful little booklet . . written in simple language . . . and there is a photograph of each tree with a drawing of its leaf. It will also be welcomed by many adults who wish to learn how to distinguish the more important Canadian trees."

Montreal Witness: "The advice has often been given that if you want to educate the people you must begin with the children. The Canadian Forestry Association, which has for several years been carrying on a strenuous campaign urging the proper conservation and care of the forests and trees generally, has now apparently adopted this point of view and has issued a useful little booklet. It is hoped to place one in the hands of every boy and girl in the country so that all may be able to distinguish readily our more important Canadian trees and have an intelligent understanding of the great uses to which they are put."

Manitoba Free Press: "If this little booklet does not make musing Thoreaus of Canadian nature lovers it is at least calculated to develop very widely an interest both in the beauty and utility of the trees of the Dominion. Incidentally the case for forest conservation is strongly put."

Toronto World: "It contains clear and simple descriptions of twenty of the most important trees."

From the manager of a large paper company: "I would like very much to obtain another copy. I think it is one of the most useful publications of its kind issued."

From a Toronto clergyman: "I shall feel very much obliged if you will let me know where I may purchase additional copies."

From a High School principal: "Kindly send me a few copies. I believe it will be valuable in our Nature Study and Elementary Science work."

A Wood Lyric

By Wilfred Campbell.

Into the stilly woods I go,
Where the shades are deep and the wind flowers blow,
And the hours are dreamy and lone and long,
And the power of silence is greater than song.
Into the stilly woods I go,
Where the leaves are cool and the wind-flowers blow.

When I go into the stilly woods,
And know all the flowers in their sweet, shy hoods,
And the tender leaves in their shimmer and sheen,
Of darkling shadow, diaphanous green
In those haunted halls where my footstep falls,
Like one who enters cathedral walls,
A spirit of beauty floods over me,
As over a swimmer the waves of the sea,
That strengthens and glories, refreshens and fills,
Till all my inner heart wakens and thrills.
With a new and a glad and a sweet delight,
And a sense of infinite out of sight,
Of the great unknown that we may not know,
But only feel with an inward flow
When into the great, glad woods we go.

O Life-worn brothers, come with me
Into the wood's hushed sanctity,
Where the great, cool branches are heavy with June,
And the voices of summer are strung in tune;
Come with me, O heart out-worn
Or spirit whom life's brute-struggles have torn,
Come, tired and broken and wounded feet,
Where the walls are greening, the floors are sweet,
The roofs are breathing and heaven's airs meet.

Ontario Settlers Cause Many Fires

Between Pembroke and North Bay This Year's Losses Are Attributable to Farm Clearing

It is only a matter of a few years at most until every Canadian province compels its settlers to knuckle down to the law of fair-play in the matter of slash and brush burning. With the continued improvement in railway precautions against forest fires, the question of dealing with the settlers becomes more and more urgent. Regulations covering fire prevention as imposed by the Railway Board upon the steam roads have relieved them of much of their old reputation as the chief cause of forest destruction. In Ontario it is an unquestioned fact that of the scores of this year's fires, large and small, between Pembroke and North Bay, more than eighty per cent. have been due to settlers. The railways have been a relatively unimportant factor in Ontario's losses thus far in 1915. It is understood that Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines, is giving the question of control of settlers fires earnest consideration with a view to devising some means of bringing the evil under control. Ontario now has no permit system and is paying for the absence of it in very large annual sacrifices of timber.

The tendency of all our provincial governments is undoubtedly in the direction of settlers' permit system. British Columbia manages to enforce fairly stringent regulations governing the burning of brush and slash without much offence to the farming population; it is even said that the settlers have accepted the law and its administration as the only fair method of overcoming a danger the consequences of which they share in common with the lumbermen. Quebec is making an earnest effort to get abreast of the necessity for province-wide control of slash and brush firing. Prosecutions of guilty parties are becoming more frequent and magistrates are increasing the severity of punishment. It may be that a larger staff will be required to effectually control the settlers from setting out fires during the danger seasons, but at least the Department has shown determination in the matter and will gradually overcome the handicaps.

New Brunswick has taken steps which may mean a province-wide control of settlers' fires. On July 10, a special regulation of the Department of Lands and Mines was put into force by Hon. George J. Clarke, blanketing the settlements of Hazen and Grimmer in the County of Restigouche and lands adjacent thereto. "Before any brush piles or slash in clearing lands can be burned," reads the regulation, "a permit in writing must first be obtained from the caretaker of said settlements and due notice must be served on the adjacent land owner or occupier . . . . under a penalty of not less than twenty dollars and not more than two hundred dollars. Settlers are notified that this regulation will be strictly enforced in future."

The foregoing order was issued as a result of very serious fires which occurred this spring in Hazen and Grimmer districts due to the unregulated burning of settlers' slashings. Since three provinces, British Co-

lumbia, Quebec, and New Brunswick have now recognized the necessity of settlers' permits, it would seem only logical that Ontario with a splendid forest possession still intact should take hold of the question and decide upon a permanent and practical policy.

A Survey of New Brunswick's Forests

In New Brunswick there are about eight million acres of forest lands held by the Crown, part of it under lease, and about four million acres held in fee simple. The Crown has, therefore, an immense asset within its control which intelligent management will turn to the permanent enrichment of the people. Lumbering and its allied industries form a substantial part of New Brunswick's commercial interests. Although immense quantities of timber have been destroyed by fires in the past and present, enough remains to give foundation to the lumber industry for all time to come, if the administration makes itself equal to the opportunity.

The estimates of merchantable timber, of burned areas, of barren lands, etc., as applied to New Brunswick, are vague and unsatisfactory. The present Government, at the head of which is Hon. Geo. J. Clarke, Minister of Lands, recognizes the necessity for a forest survey very clearly. The agitation for such action in the province is quite pronounced. At the last session of the Legislature the sum of $50,000 was arranged to be spent during 1915 and it is understood to be the intention of the Premier to have the survey started within a very short time.

During recent weeks, Mr. Clarke, and the Provincial Treasurer, Dr. Landry, have taken the question actively in hand, and paid visits to Quebec and Montreal with a view to gathering information useful in launching the new policy. A press despatch from St. John gives the following summary:

"It is not suggested that as a beginning such a comprehensive scheme as that adopted in Quebec shall be carried out, but that a well defined plan be adopted as a foundation, and that the policy be expanded from time to time as circumstances justify. The proper classification of the Crown Lands in New Brunswick may be regarded as a preliminary step to be followed by such action as may be deemed advisable in the matter of granting such lands for settling, and in controlling in so far as possible the timber cutting by settlers on these lands. It is realized that in the past considerable areas granted for settlement purposes, proving unsuited for cultivation, have simply been cut over for the timber carried and then abandoned, and it is felt that by a thorough knowledge of the nature of the soil in all Crown Lands, standing timber may be protected from this form of loss, and settlers provided only with such grants as are formed of soil suitable for general agriculture. Ultimately it is hoped to introduce a preliminary scheme of reforestation in which respect but little is now being done in New Brunswick, in fact the only definite work along this line being carried on by the Pejepscot Lumber Company. If all goes well Premier Clarke and Dr. Landry will have some definite suggestions to lay before the next session of the legislature."

FROM COAST TO COAST

THE PRESIDENT'S ADDRESS.

"The Municipality and the Conservation of the Forests" is the title of an address to be delivered on August 26th at the 10th annual convention of the Union of Nova Scotia Municipalities by Mr. F. C. Whitman, President of the Canadian Forestry Association. The meetings of the Union will be held at New Glasgow and the programmes contain a range of subjects practical and stimulating.

RIVER DRIVERS UNDER CONTROL.

A great betterment of fire conditions in Quebec Province has come about this year through the placing of a special ranger with each drive crew. This has reduced a usually prolific cause of fires to a minimum, only one blaze having so far been attributed to this source. In past seasons the indifference of the drivers to the safety of the forest about them has been the cause of wholesale trouble.

ENCOURAGE PLANTATIONS.

Other communities throughout Canada might take pattern by the Parish of St. Jacques de Piles, Quebec, which entered into agreement with the Laurentide Company Ltd., of Grand Mere, not to raise the taxes on lands used for tree planting for a period of twenty-five years, at the end of which time the agreement can be renewed. The company will continue its plantations in the parish until all available land has been placed under forest crop. Fire lines have been cut around the plantations and along the roads. Model highways also have been constructed.

ADJUSTING TAXATION.

Hon. Jules Allard, Minister of Lands and Forests, Quebec Province, has under consideration the better regulation of taxation on lands used for reforestation. It is understood that an announcement will be made at the next session of the Legislature.

WHO IS THIS MEMBER?

The Secretary of the Association is in receipt of a letter postmarked 'Hudson Heights, P.Q.' and containing a one dollar bill, together with a membership card which the sender has forgotten to fill in with his name and address. If the party will please write to the Secretary credit will be given him for the amount.

STUDENTS ON FOREST SURVEY.

Six graduate students in the department of forestry, Cornell University, have recently completed a detailed working plan for a 3,500 acre tract in the Catskill Mountains. This tract lies at the headwaters of the well-known Esopus River, the main feeder of New York City's mammoth Ashokan reservoir, and hence is of great value as a protection to this and other streams arising in the vicinity. The tract is divided into steep upper slopes and more gentle lower slopes, about half of the 3,500 acres being in each of the two slope types.

This is the second season's work done in the locality, the first season's consisting of a detailed forest survey of the tract. The present year's work secured additional facts necessary for the preparation of a detailed plan of forest management.

AEROPLANE HUNTS FOREST FIRES.

Milwaukee, August 3, 1915.—Henceforth the aeroplane will be an important factor in hunting for forest fires in northern Wisconsin. Jack Vilas, an aviator, has been appointed a forest ranger and is now using his hydro-aeroplane, now at Trout Lake, in detecting fires and reporting their extent.

E. M. Griffith, head of the Wisconsin forestry department, recently visited Trout Lake and made an ascent with Vilas. They went up 1,200 feet and the ease with which a little fire several miles away was located so impressed the chief forester that he determined to make Vilas a fire scout.

Heretofore the view a ranger has had of the surrounding country has been limited to that given from a 60-foot tower at the various forestry stations. Vilas recently discovered a fire thirty miles off and on investigation found he had made an accurate estimate of its distance and extent.

The hydro-aeroplane will reach the place of a fire in a few minutes, where with ordinary facilities of the forest ranger, hours would be consumed. Hard trips on foot over trails to learn the extent of fires far from roads will be avoided by the use of the hydro-aeroplane.

B. C's DISCOVERY.

Victoria, B.C.—An interesting instance of the extent to which the timber resources of the Province have been under-estimated is given in reports recently submitted to the Honourable W. R. Ross. Cruisers lately returned from an examination of the valleys of the Elk, Salmon, White and Gold Rivers on Vancouver Island came across one hundred thousand acres of unalienated crown timber, with an average stand of fifteen thousand feet to the acre, representing a total of one and a half billion feet. This timber is readily accessible, in fact the grades which exist in these valleys render it possible to bring logs across the island from Nootka to Salmon River, crossing the surveys of the Canadian Pacific and Canadian Northern railways.

GRAND TRUNK'S GOOD MOVE.

Mr. Morley Donaldson, Vice-President of the Grand Trunk Pacific Railway, announced that the installation of oil burning locomotives on the mountain section of the line has now been completed. These locomotives are of the most modern type and were placed in service for passenger traffic for the first time July 30th. They are operating from Jasper to Prince Rupert, over 719 miles of main line.

Especial interest attaches to the installation of this class of motive power, as it marks the first use of oil burners on an extensive scale in Canada. Great oil storage tanks have been erected at various points along the line, for supplying locomotives with the necessary fuel. With the operation of these locomotives there is a complete absence of the discomforts which sometimes arise from the use of coal with its tendency to give off dust and grit.

The section of the line on which these locomotives are being used passes through the finest scenic territory in the Canadian Rockies and the absence of coal dust, it is believed will add to the pleasure of the journey.

The Grand Trunk Pacific Steamships "Prince George" and "Prince Rupert," which operate from the Pacific terminal of the line at Prince Rupert to Victoria, Vancouver and Seattle, are also oil burners, and this gives the Grand Trunk Pacific nearly 1,500 miles of rail and water route on which this form of fuel only is used.

Forest Fire Situation

Abundant Rain-fall in Ontario and Western Quebec—British Columbia Facing a Dry Hot August.

Since the last report in the Journal was written, the heavy rains in Ontario and the western portions of Quebec have kept down serious forest fires and made those parts of the country fairly immune for some weeks to come. No very large fires have been reported in the territory mentioned, although settlers' fires in Ontario have been this year a source of much anxiety. In Eastern Quebec, fires were frequent until about the middle of August when rains improved the situation. Many stubborn outbreaks were encountered by the Quebec Forest Service, and the protective associations but the latest reports speak of the danger as having temporarily lifted.

In the West.

Reports from the western provinces indicate that practically the only district where there is serious danger from forest fires is in British Columbia. Particularly in the Fraser Valley and the southern parts of the province. Conditions have been very dry there and a considerable number of fires have been reported although the damage at the present time would not appear to have been very extensive. In the Provinces of Alberta, Saskatchewan and Manitoba the weather has been moderately damp and consequently the number of fires reported has been comparatively small. The weather the last month has been drier than during the month previous but there will be no serious danger unless the dry weather continues without any rains intervening.

The Victoria Report.

Victoria, August 14: The Minister of Lands is in receipt of telegraphic advices covering the fire situation during the past week throughout the province. With the exception of the Hazleton and Prince Rupert Districts, where rain has made the position comparatively secure, the weather has been hot and dry, and very favourable to outbreaks of fire. In the Tete Jaune division all fires have been extinguished with the exception of one north of Berg Lake, Mount Robson Park, and intermittent strong winds add to the task of the fire-fighters. From Fort George, Nelson, and Cranbrook districts, reports show that all fires have been extinguished or are under control, without serious damage being done. The hazard in the Lillooet section is great, owing to occasional strong winds, and similar conditions prevail in the Kamloops district. Twenty-five thousand feet of timber were burnt as a result of two outbreaks in the Kettle Valley, and six other fires were fought in the Vernon forest district. Intensely hot and dry weather accompanied by light winds from the south was responsible for an exceedingly dangerous situation in the Vancouver district, where no fewer than 48 fires were fought, the area burnt over being approximately five thousand acres, principally slash. Much damage was done to property, including destruction of two houses in the Fraser Valley, and cabins in Burnaby and North Vancouver. The fires at Gordon Pasha Lake and

Siamond are burnly fiercely and beyond control, but the efforts of the fire-fighting crews have been successful with these exceptions, and further damage averted. The western divisions of the Island forest district reports no fires, but there are several fires around Parksville, one serious outbreak near Courtenay, and two on Denman Island, which are being fought. Fires on the Islands between Nanaimo and Ladysmith are under control.

With the drying up of vegetation, and the lack of rain, the fire hazard is increasing, and only by dint of the utmost care and precaution with fire will destruction of life and property, and heavy outlay by public bodies and private individuals be avoided.

Fish and Game Clubs Organize

Laurentian Societies Unite to Fight Forest Fires—First Public Effort of the Kind in Canada.

The idea of co-operative forest guarding has taken a new direction, and one which suggests boundless possibilities. The Canadian Northern Laurentian Association put into operation this summer a fire protective branch, aiming to be of service not so much to prevent destruction of the buildings within its area as to protect the splendid forests requisite for scenic beauty and the delights of hunting and fishing. This is said to be the first undertaking of its kind in Canada. The members have no lumbering or pulpwood interests but regard the forest from the point of view of health and pleasure seekers. The motive apparently is quite sufficient to create a determined forest protective branch to which contributions and personal services have been devoted without stint.

The Canadian Northern Laurentian Association is formed of affiliated clubs situated along the Montfort branch of the Canadian Northern Railway. The membership of these various clubs is made up principally of summer residents. Writing to the Canadian Forestry Journal, the President Mr. W. A. S. Ayerst of Montreal, spoke of the new activities as follows:

"Realizing the damage that is being done annually from forest fires, we feel that the fire protective branch that we have organized is bound to become the most important part of our association. We have already had this season one bad fire to contend with, which was checked after a stubborn fight with the loss of only one summer home. If it had not been for the organization of our fire fighting branch, there would likely have been several houses destroyed. We, of course, realize that the loss of the summer home is the smallest part of the damage that can be done by forest fires, as we can protect ourselves from this damage by carrying fire insurance, but what we most fear is the destruction of the natural beauty of the surrounding forest and shrubs which would spoil any particular spot for future building for a great many years, and, of course, we cannot insure against this except by organizing ourselves along proper lines. We also realize that with the destruction of the forest by fire, the fishing and hunting of the country in which we are in-

terested will be spoiled, to say nothing of the natural beauty and the general financial loss.

"We think that we are the first organization formed by the general public to combat fires, and hope that the effects of our organization will spread throughout the various districts that are popular with city people and thereby educate and influence them to the dangers and horrors of forest fires, and eventually to educate the farmer or settler to a proper care when burning brush or clearing land."

Mr. Ayerst makes a kind reference to the influence of the Canadian Forestry Association upon the new movement of the affiliated clubs and the Canadian public in general.

In the Canadian Northern Laurentian Association the following are represented: Bark Lake Protective Association, Bark Lake, via Arundel, P.Q.; Lake View Protective Association, Lake View, via Weir, P.Q.; The Sixteen Island Lake Fishing Club Inc., Sixteen Island Lake, P.Q.; Leclerc Island Protective Association, Leclerc Island, P.Q.; The Newaygo Club, Newaygo, P.Q.; Lake Echo Fish and Game Club, Morin Heights, P.Q.

Prosecutions Cut Quebec's Losses

Four Parishes in St. Maurice District Decreased Their Forest Fires From 105 to 4.

The proper kind of action in the case of incendiary settlers and itinerants in the frontier districts of Quebec Province has been taken this summer by managers of two limitholders' Associations, the St. Maurice and the Lower Ottawa.

Only by co-operation of the local magistrates and the fire inspectors who bring guilty parties to trial can real reform be brought about. Instances have been encountered where out-of-work residents boasted in public that something must be done to provide work and that a forest fire would be the simplest means of getting a job at two dollars a day. Threats such as these have been carried out; in a few cases the offender has been caught and punished.

Neither the Quebec Government nor the mutual companies engaged in forest protection have the least desire to impose drastic penalties on settlers within their jurisdiction, but it has been found necessary to make examples of a few in order that the many may take the lesson to heart. The law against forest incendiarism is a relatively new one—certainly new in its application—and old and criminal customs require harsh remedies. In four adjoining parishes covered by the St. Maurice system, there were reported in 1913 no less than 105 fires. As a result of the permit system and hearty prosecution of offenders, the following year showed an amazing drop to 4 fires. The Provincial Government displayed great vigor in following up complaints of the fire rangers, and their policy is equally in evidence this year.

One of the residents in the territory patrolled by the Lower Ottawa association was arrested for causing timber fires and was fined $115. Being unable to meet the fine he remained in jail three months, at the

end of which time his friends produced the required sum.

Mr. Sorgius, of the St. Maurice Association, secured a conviction during the present month by which a guilty settler paid $10 fine and over $90 costs. Sixteen similar cases have yet to be heard.

One of the difficulties in the past has been the proper circulation of news concerning these prosecutions so that settlers, trappers, and others in all parts of the Province should learn the facts and pattern their conduct accordingly. By a recent arrangement, the Publicity department of the Canadian Forestry Association has undertaken to spread information concerning prosecutions of all parties found guilty of breaking the permit laws or of wilful incendiarism. This will be done through the French and English newspapers of Quebec Province and should considerably enhance the efforts of the authorities to educate the people to a sense of their public duties.

The Kind Godmother and the Foolish Children

A Too True Fairy Story For Young Readers.

(Written for the "Canadian Forestry Journal")

Once upon a time there was a good godmother with a great many godchildren but as she had great possessions she was able to provide for them all.

One day she called her favorite godchildren together and said, "I am going away to arrange the affairs of my other godchildren, and before I go I will divide among you this estate. It is a very rich and beautiful estate and with industry and intelligence you may live well and make your inheritance even more valuable than it is now, and may God grant you good health to live long and enjoy it." And when the estate was divided she took her journey to her other godchildren.

The Godmother's Return.

After a good many years she came back to visit the family and called them all together to see how they did, and how they had managed the estate. Though the children were now all grown up and married they all lived on the estate, for indeed they had nothing else to live upon. They were all very glad to see their godmother and took great pleasure in showing her how they had enlarged the old house and built new ones and how they had cultivated the part of the estate nearest the village and had enlarged the blacksmith shop and the tannery, got new machinery in the saw-mill and repaired the grist mill.

When they had returned to the lawn in front of the old homestead their godmother said:

"I suppose the first thing you did was to call in a surveyor and find out how much farm land and pasture land and woodland you have and what water powers are on the streams, and what mines in the hills, so that you might use all to the best advantage?"

The Children's Excuses.

They replied that they had been so busy at the front of the estate that they really did had not taken time to find how large it was, or how much was woodland, pasture-land and farmland. They always supposed there was plenty and so they did not bother. Latterly, however, they had begun to wish they had done so for the previous spring, when they tried to make a new wheat field in the place where the nearest woodland used to be, they found it was just a mass of sand which would grow nothing, that is nothing but trees. And all the trees had been burned off by a fire started to clear out a corner of the back pasture. They might have stopped the fire but as they thought it would clear the land they let it run. Now the trees were all gone from that part and the soil was fit for nothing.

"I noticed," said the godmother, "that the mill dam above the mill is broken and that you run the mills with steam instead of water. How is that?"

The Abandoned Mill Dam.

"When we burned off the woodland and there had been more fires in the forest land back of that," they said, "we found the little river that ran the mill rose in a torrent every spring and then dried away to a rill all the rest of the year, so that we had great difficulty in running the mill. Then one spring the flood was so great that it carried away the mill-dam. So we thought it better to put in a steam engine and not repair the water-power."

"And do you burn wood to make steam?"

"No. Wood has to be brought too far, so we burn coal, which we bring in from the next country."

"I noticed too," she continued, "that high winds and insects seem to have destroyed a great part of the crops. It was not so in the old days."

"You see," they replied, "since the forest was cleared away there has been nothing to stop the high winds. Thus the grain is blown down, and the fruit is blown from the trees, and also there is no longer cover for the bird that used to eat the bad insects and now they every year take a good part of our crop. We have tried to induce the birds to come back but they fly away to make their nests in distant forests."

"Where is Andrew?" asked their godmother suddenly for she had been carefully counting all the children.

"Andrew," they said, "is a lumberman now and since we burned the forest behind the back pasture it takes him two years to get his logs to the mill. One year he cuts them and gets them into the upper streams and it takes all the next season to float them down the river to the mill. This is the year he is away from home."

"And did you never," asked the good godmother, "try to find out whether there was farm land near the forest where Andrew cuts his timber, or how much timberland there is on the farm?"

Then Came the "Stranger."

"A stranger walked over the place once," they replied and he said that more than half the farm was fit only to grow trees. We did not believe him but since the near woodland was burned we think there is something in what he said."

"Is timber so useless that you are ashamed that more than half the farm will grow nothing else?"

"On the contrary," they said, "the timber is very valuable and grows more valuable every year. Next to our crops and cattle the forest is the best paying part of the estate. Since we learned that we have wished the fires had not burned so much."

"What trades and professions did your children take up?" was the next question.

"Alexander is a farmer; Benjamin, is a blacksmith; Charles is a

clergyman; David is a doctor; Eleanor is a school teacher; Frank is a lawyer; George is a dancing-master; Harriet manages the poultry; Isabel is married to a stage-driver; Jacob is a juggler"—

"Hold," said the good godmother, "Which of you boys is the forester?"

The Children Are Rebuked.

"Oh godmother dear," they said in pained voices, "we are practical, industrious people and we do not believe in 'fancy' professions."

"Fancy professions," retorted their godmother warmly. "Your forefathers were foresters before they were farmers. So far as you know more than half your estate is fit only for timber. If you had kept timber on that near woodland you would not have had the mill dam washed away, you would not have to burn coal to run the mill, your crops would not be blown down or eaten by insects and Andrew, the lumberman, would not have to spend two seasons in getting his logs to the mill. The man who could help you in all this you call a man with a "fancy" profession while you practical old-fashioned children are jugglers and dancing-masters and what not."

And for all she spoke so tartly they did not resent it but resolved to take heed to her advice because they knew she loved them and wished them well.

Now you will say that no family ever acted in such a silly fashion as to have a great estate given them and not to find out how large it was or what it contained, or who would neglect and burn up their second great source of income.

But this, alas, is a true story. The name of the godmother is Dame Nature. The estate she gave is called Canada and her children are you and me and all the other people you see in Canada. We had not a single forester in all Canada in 1898 nor for several years after. We do not yet know how much timber we have and we allow every year great forests to be burned. Insects are destroying our crops, our wells are drying up, our rivers are being destroyed and still we think we are some of the cleverest of Dame Nature's children. Have we not been foolish and is it not now high time to become wise?

PROTECTION ON UPPER OTTAWA

During the summer Mr. M. J. O'Brien has established a very effective fire protective organization, under the direction of Mr. W. G. Sweezy, on his extensive timber areas of the Upper Ottawa region. An efficient force of fire rangers is kept constantly busy cutting trails to facilitate rapid movement from point to point, and look-out stations have been established on all the prominent heights so that it is now possible for the staff of rangers to overlook every day the entire area of some 1,200 square miles of Mr. O'Brien's limits besides an enormous area of adjacent forests. More trails are constantly being cut and every ranger is kept busy. Mr. Sweezy has also commenced a detail cruise of every square mile of Mr. O'Brien's limits to ascertain the exact quantity of timber and the best methods of operation. In this work the fire-ranger trails serve a most useful purpose.

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TENDERS FOR PULPWOOD LIMIT

TENDERS will be received by the undersigned up to and including Wednesday, the fifteenth day of September, 1915, for the right to cut pulpwood on a certain area situated north of the Transcontinental Railway, west of Lake Seul and south of English River in the District of Kenora.

Tenderers shall state the amount they are prepared to pay as bonus in addition to the Crown dues of 40c. per cord for spruce and 20c. per cord for other pulpwoods, or such other rates as may from time to time be fixed by the Lieutenant-Governor in Council for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory, and to manufacture the wood into paper in the Province of Ontario—the paper mill to be erected within such time and in such place as the Lieutenant-Governor in Council shall direct.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into an agreement to carry out the conditions, etc.

The highest or any tender not necessarily accepted.

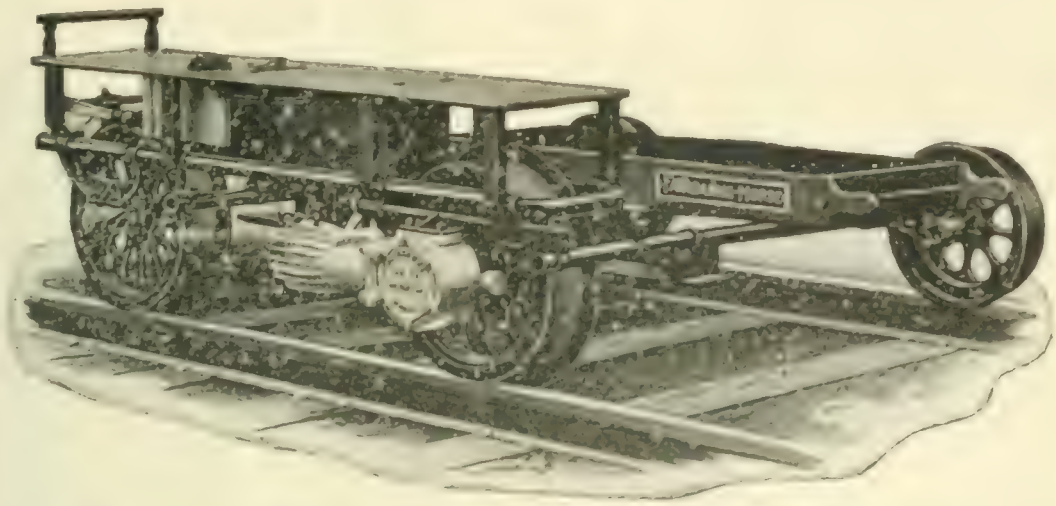
For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

N.B.—No unauthorized publication of this notice will be paid for.

G. H. FERGUSON,
Minister of Lands, Forests and Mines.

Toronto, June 5th, 1915.

Undesirable ground condition following logging operations.



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La forêt est la partie vitale de la Province de Québec, aussi gardons-la vivante. "UN SEUL ARBRE PEUT PRODUIRE DES MILLIONS D'ALLUMETTES, ET UNE SEULE ALLUMETTE PEUT DETRUIRE DES MILLIONS D'ARBRES".

Soyons prudents, protégeons cette forêt, **nous en avons besoin!**

The St. Maurice Forest Protective Association Limited, Trois-Rivieres, Que.

Tens of thousands of these notices were distributed to Quebec settlers by the St. Maurice Forest Protective Association. The following is a translation:

NOTICE TO SETTLERS!

Have you any slash to burn this spring? If you have, apply to the fire-guardian of your district who will give you a permit for this purpose, the work being carried out under his supervision, and by following the instructions of the fire-guardian, you are relieved of all responsibility; at the same time you assist in protecting the forest which is in your interests and the interests of all.

The forest is a vital part of the Province of Quebec; therefore, let us keep it alive. "A single tree can produce millions of matches and a single match can destroy millions of trees."

Let us be prudent! Let us protect this forest! **We Need It!**

The St. Maurice Forest Protective Association, Limited, Three Rivers, P.Q.

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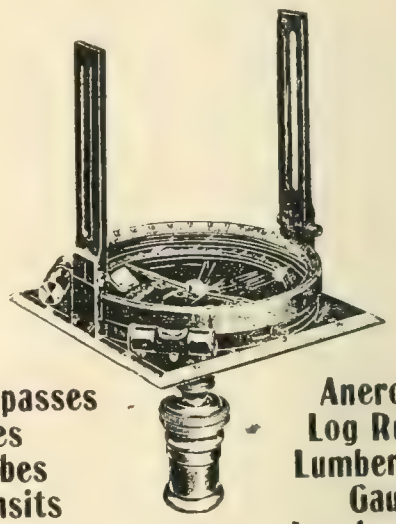

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SCIENTIFIC FIRE FIGHTING.

Albany, N.Y.—Forest fire fighting along scientific lines was instituted by the Conservation Commission to-day when Assistant Superintendent of State Forests, W. G. Howard, mailed to every member of the forest fire field force a United States topographic sheet covering each ranger's territory, with a set of colored crayons for converting it into a graphic fire map of his district. With all of the different types of forest indicated with respect to their inflammability by different colors on the map and with telephone lines and instruments, roads and trails, camp stores and supplies of tools located by appropriate symbols, it is intended that the fire map shall furnish a basis for determining in advance how fires under every condition and in every location should be fought.

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ELEMENTS OF FORESTRY

By Professors F. F. Moon and Nelson C. Brown, N. Y. State College of Forestry at Syracuse.

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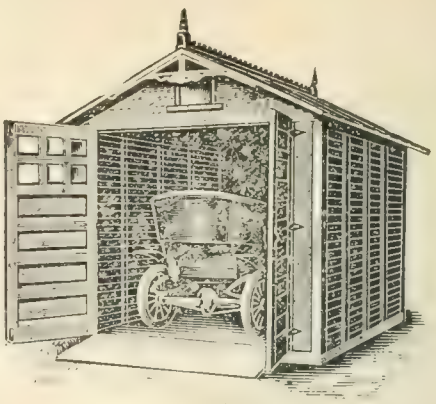

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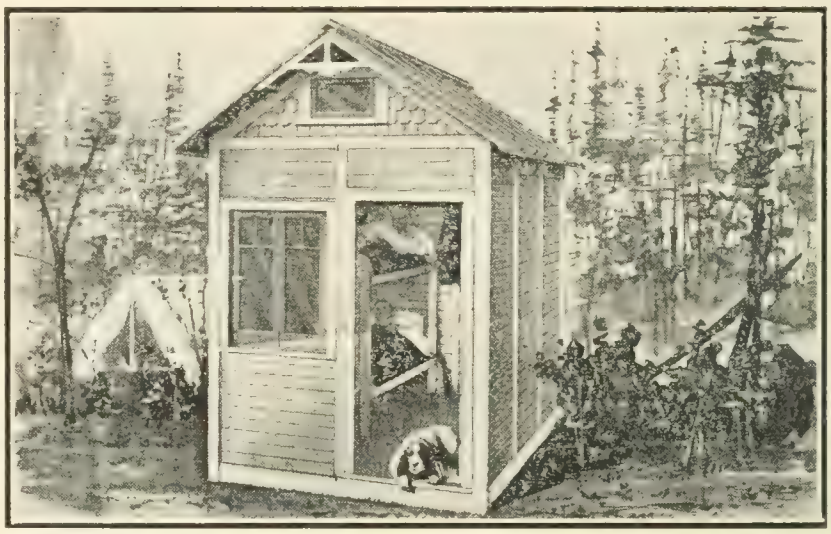

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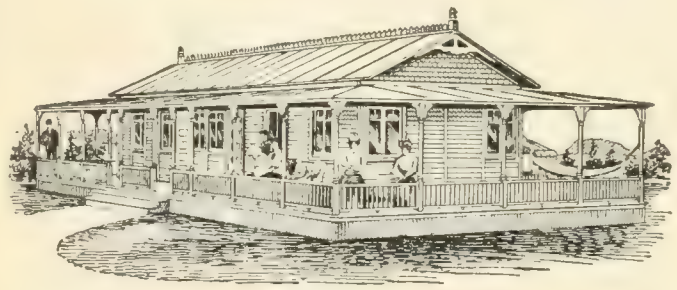

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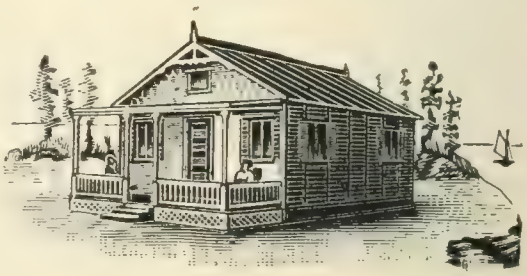

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A GRAND JURY'S PROTEST

Evidence is everywhere coming to light that the wrecking of Canada's forests no longer has the acquiescense of the general public. At the summer Assizes at Parry Sound, Ontario, a few weeks ago, two suits were entered against railway companies for damage to standing timber alleged to be caused by locomotive sparks. At the conclusion of the session, the Grand Jury of the District Court offered a strong protest against the negligence of forest officers in bringing guilty parties to justice. Part of the Grand Jury's protest was as follows:

"One of the important matters taken into consideration by the Grand Jury at this session was the awful destruction of our timber wealth by fire.

"Your Grand Jury, which is mostly composed of yeoman of the district, has come to the conclusion that unless the present laws enacted are enforced, and enforced with vigor, in the course of a few years the uncultivated portion of our district will be one vast brulé.

"We are of the opinion that the laws governing the preservation of the timber are adequate if enforced and we will advise those in authority to see that in future this shall be done.

"We have made enquiry regarding prosecutions and find that not a single criminal case has been instituted and the settler as a rule is not in a position financially to proceed in the civil courts.

"The blame of forest fires may be attached to careless settlers, careless tourists, careless bushmen and careless brushmen and careless railwaymen, but in our opinion this carelessness will continue till the officers appointed for the purpose of preserving the forests from fire wake up to their responsibilities and bring the delinquent parties to justice by criminal proceedings."

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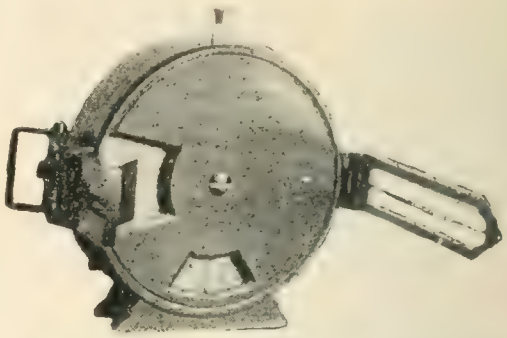

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Canadian Forestry Journal

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GUARDING THE LOWER OTTAWA

The organizing of limit holders into mutual fire protective associations has had about four years of rigid testing in Canada. The good results have been so convincing that new associations in all the forest provinces must sooner or later come into existence. With a few exceptions the members of the St. Maurice and the Lower Ottawa associations in Quebec, each embracing about 12,000 square miles, are committed permanently to the idea of forest protection by co-operative effort as against any other system. The objects of efficiency and economy are attained in a degree quite impossible where politics or other fettering influences are present.

Recently the Secretary of the Canadian Forestry Association, in company with Mr. Clyde Leavitt, Forester of the Commission of Conservation, and Mr. Arthur H. Graham, Manager of the Lower Ottawa Forest Protective Association, was privileged to pay a visit to Devil's Mountain which overlooks a radius of thirty to forty miles of the Gatineau and Lievre watersheds. Devil's Mountain forms a pivotal point of the Association's operations in that area. Upon its summit, the highest for at least a hundred miles

The cabin of the lookout man, on Devil's Mountain, showing Manager Graham and three of his staff.

around, was mounted last Spring a lookout tower, giving the ranger an additional altitude of about fifty feet. The work was done entirely by Mr. Graham and his assistants from materials within the immediate district and forms a substantial, wind-proof vantage-point of incalcuable service to the Association. To look across the endless miles of valley and water-courses, heavily blanketed with evergreen and hardwood forest, broken here and there with a patch of silvery lake or the misty steeples of a settlement, conveys a good idea of the ease and accuracy of discovering and locating a near or distant fire. Only a few weeks before, the ranger in charge noticed the beginning of a small blaze over thirty miles away and from his knowledge of the country was able to telephone to rangers in the neighborhood of the trouble and direct them where their services were needed. Prompt obedience isolated the damage to a fraction of an acre.

The Help of Telephones.

Half a mile through mountain trail brings one to the opposite side of the plateau where a second tower of more modest proportions surveys an additional segment of valley and hillside. Several times a day, from early Spring to late Fall, the ranger makes his round from station to station scrutinizing the surrounding country for signs of mischief. Anything suspicious is immediately reported to the nearest ranger or inspector by telephone, the instrument being located in the ranger's cabin a short distance down the mountain trail. The theory of this arrangement is undoubtedly good, but the practice is even better. Anyone acquainted with forest travel will recognize that the range of vision of a man climbing a trail or walking along a settler's road is limited to a few rods or at best a few miles. By the combined elevation of the mountain top and the lookout tower one man may survey accurately more territory than possibly two hundred men down on the forest level. The telephone line at the cabin is connected some miles away with private wires belonging to lumber and pulp companies and leads ultimately into Buckingham and the manager's office in the City of Ottawa. The Association is developing its telephone facilities as speedily as possible and will soon have the aid of a new line forty miles in length from River Desert to Tomasine Depot, built by W. C. Edwards and Co., Limited, which will eventually be carried to Lapine Depot in the Gatineau limits of the company.

The staff of the Association consists of Mr. Graham as manager, four inspectors, and fifty-eight rangers. While the extent of territory, 13,000 square miles, might make this staff seem inadequate during a dangerous season, their efficiency is very greatly increased by their power of summoning any foreman employed by a limit-holding member to turn over his staff of men at a moment's notice for fire fighting purposes. The company so called upon charges the time of the men against the Association. The advantage of this scheme is obvious, for with logging camps within reach of fires, the ranger can often commandeer plenty of good help, tools, and commissariat supplies, which are points of the highest importance in modern forest protection.

Protection's Big Dividends.

What of the practical money-saving results? As with the elder-brother of the St. Maurice, the limit holders in the first twelve months of organized operation have received higher dividends from saved timber than were ever paid to them by their sales of manufactured lumber. Occasionally one encounters a limit-holder who contends that he never heard of so many fires until the scientific fire ranging systems came into existence. The reason for his remark is hardly mystifying. In the

Lookout Tower on Devil's Mountain, which gives the ranger a commanding view of over thirty miles.

'good old days' fires were not usually seen nor their extent estimated unless they cleaned out the logging camp itself. A lumberjack usually guessed at a burn as some farmers guess at a morning's tramp—'a-mile-and-a-bit'—and let it go at that. Secondly, the fire risk in the 'good old days' was minimized by the isolation of the forests from settlement. To-day, scarcely a limit in any province but is cut into and rimmed about by settlers, the most prolific of all fire causes. Railways have also spread into the forest districts bringing with them a measure of danger. It is undeniable that the information regarding burned-over areas secured by rangers of the two Quebec associations amazed the limit holders, some of whom almost refused to believe that losses in the past had been so considerable. It is equally undeniable that with the organization of the limit holders for forest guarding purposes, the annual losses have been cut to a fraction. The total cost of guarding the territory of the Lower Ottawa last year amounted to .2995 of a cent per acre while one-dollar per acre per annum is a very modest estimate of the appreciation of average woodlands.

Non-political Management.

Beyond any other lesson which the success of the Lower Ottawa and the St. Maurice schemes contains is the identity of skilled (and non-political) management and efficient results. The inspectors and manager have absolute authority to 'hire and fire.' Rangers are held under strict discipline at all times and during the past two seasons a number of dismissals have taken place. The system of inspection is unrelenting; a ranger may be called

upon at any time to explain his movements within a given period and and if unable to do so satisfactorily his place is taken by a more promising person. No 'pensioners' of the lumber companies, no over-aged or decrepit hangers-on of the local member of parliament or legislature, are given any consideration in appointments. Young and vigorous men are invariably selected and kept at tension by frequent inspection. Surely the reason for the smartness and reliability of the associations' rangers supplies equally the reason why so many of the political systems of the provincial governments succeed in wasting scores of thousands of public money and getting second-rate results. The choosing of men on merit, and their frequent inspection by officials who are empowered to dismiss on the spot, are two of the reasons why Ontario, for instance, is saddled with a high annual outlay for fire protection and at the same time does not secure more than a fraction of the actual service rendered under the system of the limit-holders associations.

WAR'S TOLL OF FORESTERS

What a tremendous inroad has been made upon the ranks of professional foresters in Europe is indicated by the transformation in the pages of French and German forestry journals hitherto devoted to constructive discussion and reports of their professional progress. The December number of "Zeitschrift fur Forst-und Jagdwesen" comprised 63 pages and of this number 33 pages were devoted to obituaries of foresters of various ranks who fell during the early months of the war.

The March number of the same periodical comprises 97 pages, of which number 73 pages are devoted to the obituaries of foresters who fell during the early part of the war. Abstracts from a few of these obituaries are subjoined.

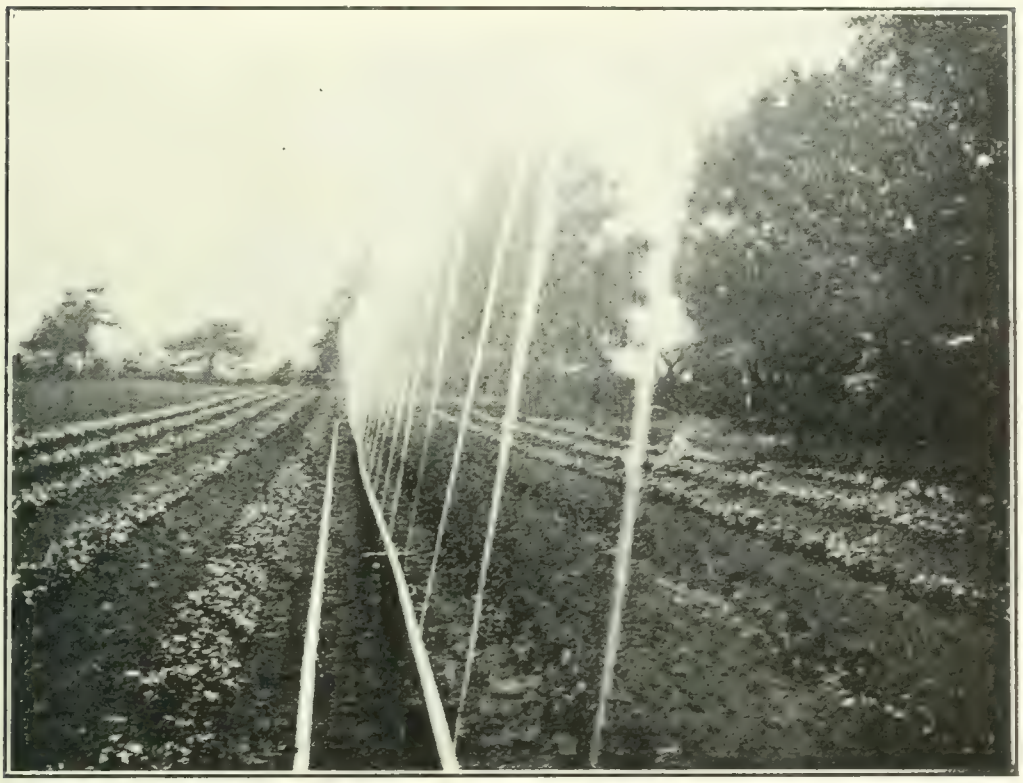
"Dudolf Prinz, a forestry student, age 20, went to the field on August 4th, participated in numerous battles about St. Quentin and Maubeuge without being injured. While storming a little village north of Reims he was wounded heavily by a shell and died a few minutes later. His comrades buried him in a solitary grave on the border of the forest La Ville aux bois."

"Forstrefendar Gunther Rodegra, a reserve officer, age 28, was shot through the head while observing the position of the enemy with a field glass. He is buried in the cemetery of a cloister in Herok la Ville, Belgium."

"Forstrefendar Dietrich von Heydesbrand und der Lase, lieutenant in the army, age 24, was heavily wounded on the night of August 23rd while his company was retreating. He spent the night, together with other wounded comrades, in a barn trying to treat their wounds, but death claimed him in the gray of the morning."

"Forstassessor Curt Kunckel, lieutenant in the army, age 26, was killed near Verdun on August 10th. The battalion to which he belonged had to retreat before burying their dead. It is hoped that the enemy or the inhabitants of the region buried him. His resting place is unknown."

"Forstassessor Alexander Weyermann, lieutenant in the army, was killed in France, August 24th. The captain of the company wrote a letter to his parents of which the following is a part: 'Your son was shot through the heart—a painless death, on August 24th.' "



The forest nursery beds at St. Williams are independent of rainfall. View shows the sprays at work on the hardwoods. The streams may be adjusted to any angle.

A MODEL TREE NURSERY

When a magician produces from an empty hat a pair of rabbits, and half a wardrobe, he is given credit by many folks with defying the laws of vision and upsetting gravity. It is only within the last few years that those Canadians even slightly acquainted with forest conditions admitted the possibility of planting up barren tracts. They believed in it only as an experiment offering occupation and instruction to professors and students of forestry schools. But as a dividend payer, as a business proposition challenging attention from municipalities and farmers with waste land in their possession, a good many people turned it aside as an interesting riddle good enough for the juggler's platform and for no other place.

While private effort has done something in the way of forest nurseries and planting up of sandy or rocky lands, to bring them again to their original crops of timber, it necessarily required the resources and stability of provincial governments to carry such undertakings to success. Quebec has done excellent work on the sand plains of Lachute (as described in the August "Journal"), and the nurseries at Berthierville. The Editor paid a visit on September 14th to the Ontario Government nurseries and plantations near St. Williams, Ont. (Norfolk County) a part of the country highly favorable to growth, as is testified by the productivity of the fruit farms and the presence of such tree species as the Sassafras, Tulip, Black Gum, Walnut, etc.

1800 Acres Under Care.

The first impression of the Government Nurseries in Norfolk is of extremely tidy appearance and business-like, economical planning. With the sand lands taken over from

farmers at about five dollars an acre, there are now 1800 acres under control, 15 acres being actually in the nursery. Looking across the property, it seemed hard to believe that five years back the place looked one of the most dismal farming prospects of the neighborhood, with a few scattered sheds, broken fences, and long strips of blow sand and boulders. It bears an appearance to-day of painstaking cultivation and has in all its equipment the mark of scientific management.

Under the guidance of Mr. E. J. Zavitz, Provincial Forester of Ontario, Prof. J. H. White, of the University of Toronto Forest School, and Superintendent Newman, the Editor of the Journal was given an opportunity of investigating many phases of the work.

The nursery beds represent all the native growing conifers, such as white, Scotch and jack pine, white and Norway spruce, Douglas fir, tamarack, etc., and a wide variety of hardwoods. The evergreen seeds are obtained in the neighborhood or purchased from dealers and are planted in rows. The growth is remarkably rapid and uniform, the little plants appearing sturdy and well rooted. Conditions of sun and moisture are controlled to a maximum degree by adjustable shades which can be rolled over the beds or removed at will. Series of perforated pipes, connected with the main water tower holding five thousand gallons, are arranged over the beds so that a gentle "rain-fall" is always at the command of the nursery superintendent, rendering the growth independent of natural moisture. The beds are kept entirely free from weedy growths and produce results, of course, far outstripping anything encountered in the natural forest. Transplanting, which bunches the roots and renders the young tree fit for the harder conditions of the open field, is also carried on in one of the adjacent fields where rows of sorghum, three to five feet high, and five feet apart, have been utilized to give winter protection to fall-planted stock. Transplanting in both spring and fall distributes the burden of labor and affords an opportunity for interesting observations. Between the sorghum rows, a gang of men was seen engaged in the planting operation. By a division of duty, one man cut with his spade along a stretched cord indicating the position of the trench. A second laborer spaded back the earth. Immediately in his tracks came the planter, accompanied by an assistant who held the pail of moistened and protected white pine transplants. With a speed nearly incredible, the planter placed a tree against the straight wall of the trench, banked in sufficient earth about it, and so continued with succeeding trees. On his heels came another worker who further filled in the trench, stamped down the surface and raked it level. The mechanical certainty of these operations and the economy of effort result in a planting record of 2,000 trees per man per day. After the first winter, the sorghum has served its purpose of wind protection and retaining the snows and is cut down.

Six Year Pine Growth.

Other parts of the nursery and plantation display quite as interesting and remarkable undertakings. Six years ago, the Department set out in a stretch of blow sand crossing the property many thousands of tiny jack pine and Scotch pine transplants. At that time the plantation averaged a few inches high and could have been uprooted in a few hours by one man. To-day, however, hundreds of the trees stand nine and ten feet high, and so dense is their growth and so strong the individual trees that a stampede of steers would make little progress in a head-on collision. Scotch and Jack pine show about equally good results. Even at their present stage

they represent very considerable money value—a potential forest which some day will give wood crops and render every square rod of the sandy waste as good a revenue producer as can be found in the county.

Hardwoods are also grown in enormous quantities, such varieties as ash and hard maple, elm, nettle tree, etc., reaching a growth in one year's time that surprises all who guage tree growing possibilities by unaided natural processes. These, too, are kept in perfect condition by weeding and artificial moisture.

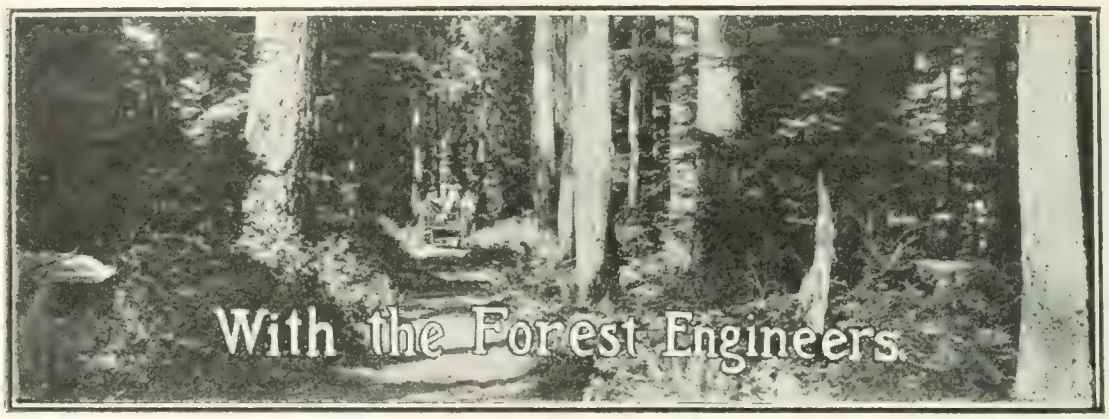
On the property owned by the Department are substantial areas of hardwood and mixed forest. They have been heavily interplanted with evergreens which are showing good development and will, in time, greatly improve the value of the woodlands. Means of protection against fire have been taken in all sections of the property, four miles of ploughed fire guards, carefully tented, traversing the timbered sections and keeping the young growth clear of risk.

Planting Up the Sands.

Of course, one of the first objects of establishing the Government Nurseries in Norfolk County was to bring it into direct relation to the problem of barren lands. This will be dealt with in a subsequent article. Norfolk County, which in parts, has ideal fertility of soil, possesses ten thousand acres of sand in one block in the townships of Walsingham and Charlotteville. To reclaim this once useful area to the purposes of timber growing, so that no square mile of the county shall bear the stigma of 'barren,' has for some years engaged the attention of the Department. Large tracts have been planted many hundreds of thousands of trees being taken for this purpose from the nurseries.

A thick growth of Scotch and jack pine at St. Williams, six years from the nursery, or about nine years from seed.

The Canadian Forestry Journal will be sent to any address for one dollar a year.



(Published in Collaboration with Canadian Society of Forest Engineers.)

On the 24th. of August, the death of Mr. F. Laliberté occured in Quebec following an operation for apendicitis. Mr. Laliberté had been nominated as a member of the Canadian Society of Forest Engineers. He was 28 years of age and had served for two years with the Quebec Forest Branch after graduating from Laval Forest School. He then organized the Forest Engineering firm of Laliberté and Marquis and at the time of his death was engaged in shipping poplar to South Africa. He was a young man with a promising future and his death is much regretted.

Assistant Forester H. K. Robinson, of the B. C. Forest Service, who holds a commision in the 5th. Regiment, Royal Canadian Artillery, is leaving for the front in charge of a detachment provided by that Regiment for active service.

Forest Assistant McVickar, of the Royal Canadian Dragoons, who has been in the trenches for several months, is no win England recovering from illness.

Deputy District Forester J. B. Mitchell and Ranger Charles Cowan were at Shorncliffe, England, when last heared from, expecting orders to leave for France.

Interesting accounts of trench flghting in Belgium came from Ranger Turnbull of the Princess Pats Light Infantry.

Forest Assistant E. G. MacDougall has left for England with one of the Eastern Canadian Regiments, preferring to go in the ranks rather than wait for a commission.

H. R. MacMillan, Special Trade Commissioner, after visiting the United Kingdom, France and IItaly, is on his way to South Africa.

R. R. Bradley, Forester of the New Brunswick Railway Company, is spending his vacation at Kingsmere, Que.

Mr. Henri Roy, visited the Laurentide Company's Nursery and experimentals plots this week.

THE FIRST FIRE LAW.

In the Bible, Book of Exodus, the twenty-second chapter, the sixth verse reads as follows:

> "If fire break out, and catch in thorns, so that the stacks of corn, or the standing corn, or the field, be consumed therewith, he that kindled the fire shall surely make restitution."

The above quoted verse is among the judgments which the Lord commanded Moses to set before the Hebrews in the wilderness.

A COLONY OF FAKE SETTLERS

When visitors to Canada are shown the natural wonders of Quebec Province, the fertile fields, rich forests and fisheries, it is to be regretted that the experience could not be spiced by a day's journey through Boyer and Campbell and a few other townships traversed by the railway from Montreal to Mont Laurier.

The condition which has won for Boyer township the notoriety of harboring the greatest number of fake settlers of any township in the province was brought about by a combination of causes, some of them obvious, and not a few obscure. Against the wrongs which have been perpetrated in Boyer the Canadian Forestry Journal offers a wholehearted protest in the belief that when the actual facts are ascertained by the authorities at Quebec a stop will be put to an indefensible practice.

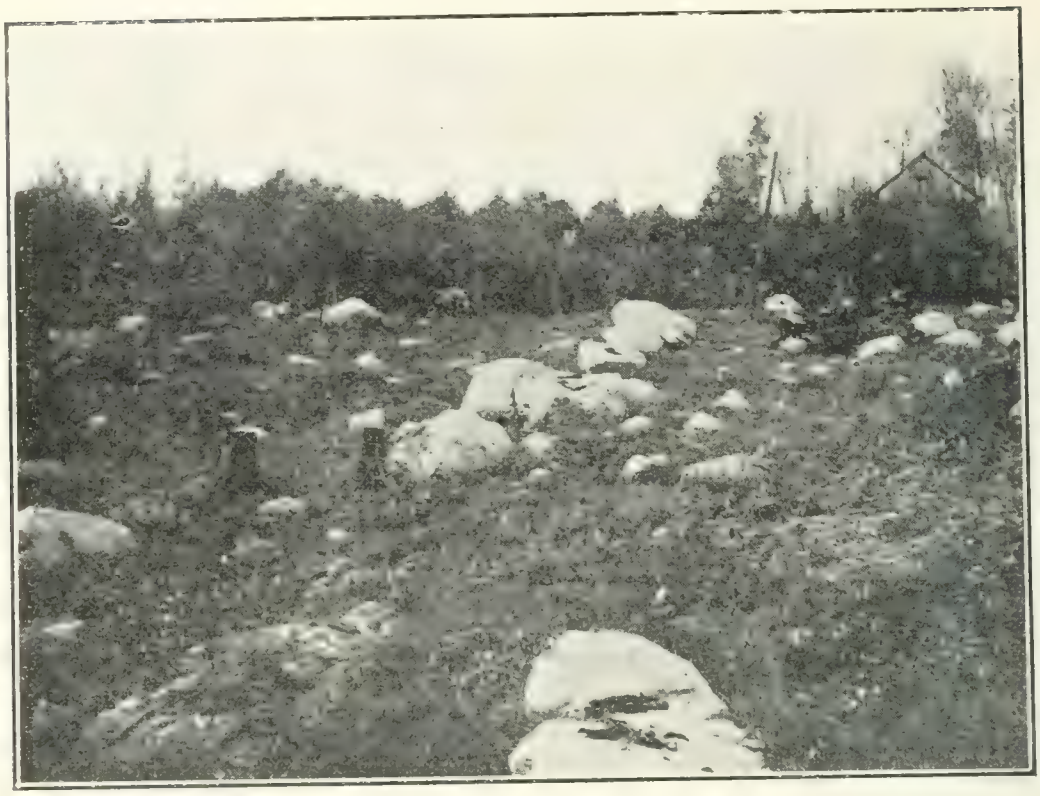
A Soil of Gravel and Boulder.

The Secretary of the Association made an examination of Boyer during the past month and saw parts of other townships involved in the same charge. Settlers are pouring into the newly-opened districts very rapidly. They are filling up the lots along the new government roads, bringing their families with them, building log cabins and preparing for a thorough-going picnic on the timber resources about them. There exists practically no agricultural soil, certainly in no such quantity as would justify an unbroken line of land farmers devoting their lives to developing field crops. Information, as much as is available, indicates that reports on the township, made by soil experts, condemned it absolutely as a farming proposition and advised that it be held under timber for all time to come. Any one with average eyesight will recognize these experts reports as decidedly conservative. Farm after farm, seen by the writer, presented a picture of gravelly, boulder-strewn soil, on which rank weeds could barely obtain nourishment. Some clearings showed considerably more area of rock than earth. On others a patch of wheat had been sown in a pocket and left there to reproduce each season and supply 'evidence' that the occupant was a real farmer and not a timber grafter. Abandoned cabins were frequent. In their vicinity lay shattered remnants of one-story barns and for a radius of hundreds of yards rocks and more rocks and still more rocks told of an acreage useful under timber and absolutely valueless in a cleared state.

An Unchecked Abuse.

Practically all the timber lands in Boyer are under license to lumber firms. They have been paying rents upon them to the Quebec Government. If the soil were adaptable to agriculture, no reasonable objection could be offered to the cutting of timber and sowing crops. But there can be no compromise whatever on the necessity of holding rocky, sandy soil for the one purpose designed by Nature—the growing of trees. No doubt this is the official point of view of the Quebec Government, but for some reason the abuse of common sense in Boyer township has been allowed to go on year after year.

The fake settler is not usually the misguided person outlined by sympathetic observers. He is part of a 'system' which has as its object the procuring of free, or nearly free, timber. The owner of a small sawmill finds that a road has been driven through a belt of particularly inviting growth. He locates his mill in the district and by direct or indirect encouragement brings to his neighborhood scores of home-

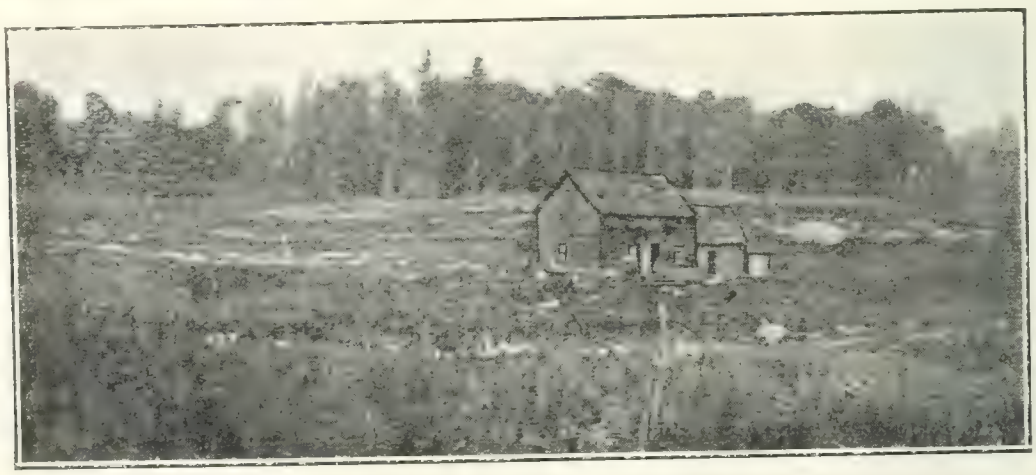


This is a "homestead" in Boyer Township. According to the fake settler's patent, he is to sow this in cereals or garden truck. As a matter of fact he has no intention whatever of "farming." His sole object is to strip the land of timber and move on. On the patch shown in the photograph he has fairly well succeeded.

steaders who are allowed under the law to pre-empt lots one mile deep without payment of a penny. The settler immediately commences to cut his timber and deliver it at the sawmill. Knowing full well that trees are the only crop the 'homestead' will produce, he proceeds to 'skin' the property, observing no diameter limit, such as applies to the lumberman, and leaves it bare of growth and makes natural reproduction well nigh impossible. Having no permanent interest in the locality he uses fire for his own convenience and if it escapes into neighboring forest, the fact gives him no worry. He is there for a day and some one else can worry about to-morrow.

Good Profits Made.

These 'skinning' operations on the 'homestead' provide the settler and his friend the sawmill owner with



A bleak and barren hillside from which the settler has cut the timber clean, leaving only a useless blot of gravel ridges and boulders. There is little pretence of farming operations.

abundance of free timber which they market at a very good profit. Naturally, the reports of profits have gone far and wide, inducing others to follow the same trail and make a living out of another helpless limit-holder. If these fake settlers were encountered only occasionally and were sandwiched in with good farm land and good farmers, a protest of this order would lose much of its force. But the trespassers referred to can be found in rows, mile after mile, with the inevitable sawmill occupying the banks of some water power. Once the timber is stripped and the land left useless the settler and his comrade of the sawmill move along to greener fields, make fresh application for a 'homestead,' and usually succeed in establishing themselves.

This is a glaring evil to which the Canadian Forestry Journal calls the attention of the Quebec authorities in full confidence that they will take adequate action.

PROGRESS ON T. AND N. O. R'Y.

While information regarding fire protection along the Temiskaming and Northern Ontario Railway seldom is encountered in print, it remains a gratifying fact that the Commission in control of the road's operations is fully alive to the responsibilities in this direction and has accomplished already more than has been generally credited. In a recent interview, Mr. J. L. Englehart, Chairman of the Commission, outlined to the Secretary of the Canadian Forestry Association the fire protection plan which had been followed for several years past. Mr. Englehart affirmed the determination of all members of the Board to provide for the road the very best fire protection equipment possible, realizing that upon the forest growth of Northern Ontario a considerable portion of the revenue of the road will necessarily depend.

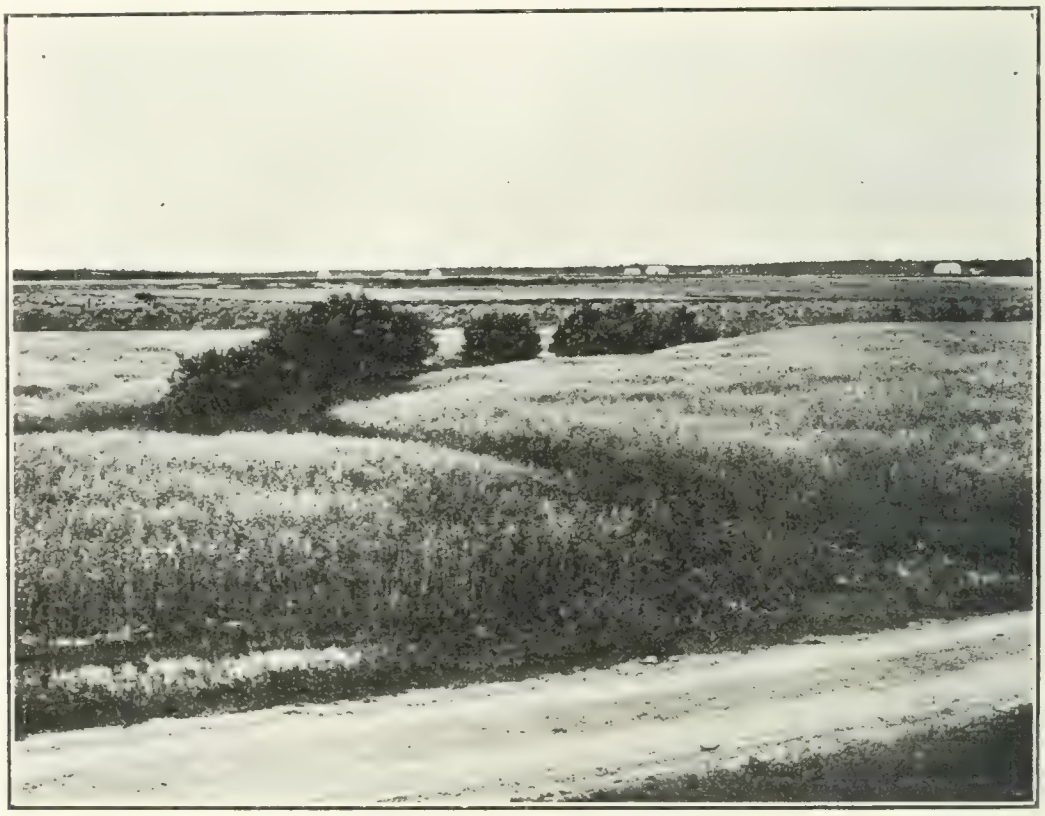
As evidence of the Board's practical interest, six tank cars holding five-thousand gallons each were placed in commission last season. These cars were fully equipped for all emergencies with specially trained crews to operate them. It so happened that the cars were not called into use last season or thus far in 1915, although they have been held ready for immediate service at different parts of the line. The right-of-way, Mr. Englehart said, had been kept clear of dangerous growth by regular cutting and burning, and on many parts of the line, clearings had been made to a depth greatly exceeding that of the private-owned railways. Whether these supplementary clearings had served a useful purpose, Mr. Englehart did not say.

In addition to the fire rangers placed on the railway by the Provincial Government, the cost of which is collected wholly from the Commission, additional rangers have been stationed in sections offering special risk. This year will involve a cost of twenty thousand dollars on the railway's part for fire rangers alone. It is noteworthy that velocipedes and speeders are seldom if ever used, the rangers being instructed to perform their duties on foot. This requires considerably more men than where mechanical accessories are employed. Doubtless as this truth becomes more evident to those responsible for the system, the foot patrolmen will be improved upon by the use of the track machines.

The prevention of settlers' fires along the right-of-way has been one of the most perplexing problems

which the Commission has had to face. For several years an educational campaign has been carried on by means of placards and literature of various kinds aiming to persuade the settlers to observe common-sense methods of burning their brush and slash. Of course, Ontario's lack of a permit law did not facilitate the efforts of the Board in this worthy direction. Everything is left to the settlers' voluntary co-operation. No such powerful leverage as the Quebec and British Columbia legal penalties for incendiarism supplemented the argument of the Railway Commissioners.

Very naturally, settlers' fires have been encountered frequently in Northern Ontario, with undoubtedly substantial losses to the surrounding districts and the province at large.



One of the splendid fields of grain bordering the lines of the Temiskaming and Northern Ontario Railway. Five large modern barns may be counted in the distance.

The Chairman and his colleagues are fully alive to the importance of forest protection work and are eager to take all steps within their power to bring about a thorough and effective co-operation between the railway, its officers, and the residents in the country which it traverses.

Considerable advance has been made in Canada in the setting apart of forest reserves. At the present time there are forest reservations throughout the Dominion as follows:

Quebec	107,997,513
Ontario	14,430,720
Manitoba	2,606,400
Saskatchewan	6,195,705.6
Alberta	16,813,376
British Columbia (in Railway Belt)	2,417,638.4
British Columbia (outside Railway Belt)	2,474,240,

making a total of 152,935,593 acres.

The Canadian Forestry Journal will be sent to any address for one dollar a year.

PROBLEM OF SLASH DISPOSAL

By

Clyde Leavitt,

Chief Fire Inspector, Board of Railway Commissioners; Forester, Commission of Conservation; Director, Canadian Forestry Association.

Beyond any doubt, fire is and always has been the greatest enemy of the forest. Lumbermen, as a class, are therefore interested in everything which pertains directly or indirectly to the prevention or control of forest fires. This is theoretically true, notwithstanding the fact that, even yet, some lumbermen—now happily a minority—apparently base their practice upon the theory that for the most part preventive measures are impracticable, and that only Divine Providence, through the agency of rain, is able to extinguish a forest firfie once it gets under way. When such lumbermen, together with a considerable portion of the general public, once realize what is really practicable in the way of reduction of the fire loss, and how well worth while such results would be from every point of view, a revolution in existing policies and methods will follow that will at once check the present process of annually converting vast areas of non-agricultural lands into a desert condition.

Seven Starting Points.

Although material improvements have taken place in recent years, still the situation as a whole is far from satisfactory over any considerable area anywhere in Canada. Some of the points in connection with which further action is urgently needed are as follows:

1. Adoption of the merit system for the appointment of fire-rangers, replacing the system of political appointments now generally in effect.

2. Larger staffs of fire-rangers. For the most part, the present staffs are inadequate to afford really efficient protection.

3. Appropriations on a much more generous scale for the construction of permanent improvements in forest sections, such as roads, trails, telephone lines, lookout stations, etc. Such works greatly facilitate the efforts of fire-ranging staffs.

4. Closer supervision of fire-rangers in the field. Experience shows conclusively that this is imperative, if efficient results are to be secured. Too often, in the past, fire-rangers have had practically no supervision, and money thus spent is largely wasted.

5. Closer co-operation between all interests concerned with forest protection. In provinces where the limit-holders are required to bear the whole cost of fire-ranging on their limits, as is generally the case in eastern Canada, experience shows that the best results are secured by the organization of co-operative associations. Of these, two are already in existence in the province of Quebec, covering an area of some fifteen million acres. It is greatly to be hoped that this movement will spread, not only in Quebec, but also into Ontario and the Maritime Provinces. There has been brought out, in the work of co-operative fire protection, a curious attitude of mind on the part of some of the men in charge of logging operations of firms and corproations who are association members. Either because they are too ignorant to appreciate the value of fire protection or are jealous of any intrusion on what they consider their own special domain, or are afraid that the crude and wasteful way they carry on their operations will be discovered, these men put obstacles in the way of fire rangers and let their subordinates and foremen see their hostile attitude, with the result that fires are set by drive crews, dam keepers and other woods workers. This causes the anomalous situation of a concern paying several thousands of dollars each year to put out fires set by its own employees, all of which could be prevented by proper discipline. The spirit of true co-operation should be instilled into these men by their managers. Only by real co-operation and the elimination of petty jealousies can the best results be accomplished.

Cut Over Lands.

6. A translation into practice of the theory that it is both practicable and desirable to afford protection to cut-

NOTE.—This article, written by Mr. Leavitt for the Canadian Forestry Associtaion, appears also in the current issue, (Sept. 15), of the "Canada Lumberman," of Tornoto.

over and even to burned-over lands, in order that the young forest growth may have an opportunity to reach maturity. Especially in Ontario, considerable areas of cut-over limits are abandoned every year by the limit-holders, and left with little or no protection from fire. Repeated fires upon such lands turn them rapidly into a non-productive or desert condition. Such lands should be the especial care of the Crown, thus ensuring the perpetuation of the forest and thereby the perpetuation of forest revenues and forest industries. For the most part, we are now subsisting upon capital, which must necessarily become exhausted in time. The restocking of the cut-over lands will to a large extent take place naturally, in time, if repeated fires are prevented.

7. The reduction of the fire hazard through safe disposal of inflammable debris.

All the above features of the fire-prevention programme are more or less inter-related and inter-dependent. It is, however, with the latter this article is especially concerned.

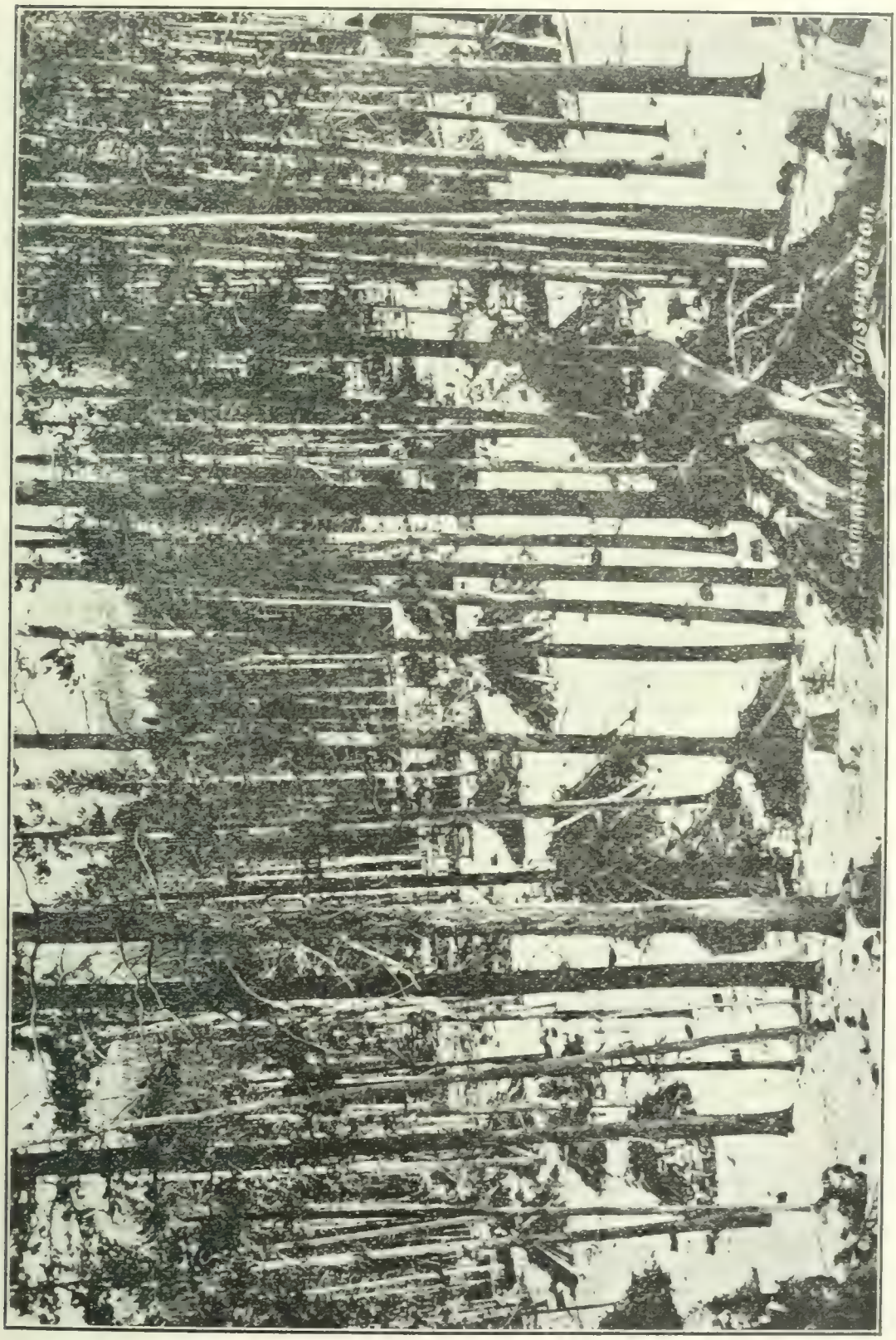
There is now a well-recognized and well-supported movement for the prevention of city fires through the elimination of unnecessary hazards. Similarly, the railways and other industrial concerns have made much progress, through the "safety first" movement, in the direction of avoiding unnecessary accidents and loss of life. The movement for the more effective prevention of unnecessary forest fires is just as logical as either of the above, and is equally a part of the general tendency toward "safety first" in all lines on endeavor affecting life or property.

The slash disposal problem has sometimes been considered as if it related only to lumbering slash. This, however, is not the case, and it may be of interest to consider some other angles of the situation as well.

(a). **Debris on railway rights-of-way.** In former times, and more especially

(Continued on page 204.)

An unlopped spruce top. Such objects in a forest constitute a grave danger. Held up from the ground the branches retain their inflammability for twenty or more years. In case of ground fire they not only supply fresh fuel but are apt to carry fire into the tops of adjacent trees.



Brush disposal on the Bighorn National Forest Reserve in Wyoming. The Forest Service requires brush disposal as one of the essential terms in connection with timber sales. The operator takes the cost of this extra work into consideration when making a bid for the tender.

CODDLING VS. CONTROLLING

The campaign carried on by the Canadian Forestry Association for statutory control over settlers' fires in every province of the Dominion, has found endorsement from a great many newspaper editors.

The Quebec Telegraph thus refers to the failure of Ontario to tackle the question from any angle, and the Quebec tendency to fight shy of drastic penalties upon guilty settlers:

"With little or nothing themselves to lose, these pioneers of the woods cause too often immense loss and damage to others and yet it is considered almost a crime in the province to speak disparagingly of them or their practices or to do anything but pap-feed and encourage them in every possible way when the proper thing would be to punish them severely for failing to take the necessary precautions to do no injury to their neighbors. The evil results of coddling these people are too frequently to be seen in the destruction of many of our most valuable timber limits and vast quantities of our forest products."

"Le Pauvre Colon."

"It is sad to think that so much destruction must recur almost every year and that we are still to a great extent powerless to stop it. Undoubtedly, the Government's fire suppression and forest service has given excellent results in that direction, but it cannot cope altogether successfully with an evil so insidious and so widespread, nor can it hope ever to do so effectually until it boldly throttles and crushes the chief cause of that evil.

Reference is had to the practice of allowing backwoods settlers to set fire to their choppings in the prosecution of their land-cleaning operations. It is your pauvre colon who in nine cases out of ten is responsible for our bush fires and the great destruction which they too often occasion,, and not the anglers or hunters, who frequent the woods at this season and who, together with their guides, are, as a rule, exceedingly careful about the fires which they set during their outings in the bush. For the one forest fire accidently caused by these dozens and dozens of them arise from the practice of setting fire for land-cleaning purposes owing to the improper times chosen by settlers to carry on their 'burns,' their utter disregard of all safety conditions and their carelessness or neglect in watching the fires which they start.

A Word for Ontario.

To which the Cochrane (Ont.) "Claybelt" adds:

What is said here of the province of Quebec is equally true of the province of Ontario. Fortunately the weather has been favorable this year and heavy rains checked the incipient conflagrations before too much damage was done, but the utter disregard of some of the settlers how far a fire might run and what forest wealth it might consume beyond their own limits, so long as it cleans their lots for the cultivation of a few acres, is such a serious menance that more drastic steps will have to be taken to teach the settler that he cannot burn down his own neighbors' lots unremittingly. Now is the time to put the fire protection business on a different and more effective basis so that we start the next season right."

Rangers M. V. Allen and F. B. Edwards, of the Canadian Mounted Rifles, are at Shorncliffe.

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GUARDING THE RESERVES

The proportion of the area of forest reserves burned over in 1914 was two one-hundredths of one per cent.
Big improvement was made in securing brush disposal after lumbering.
Campers, surveyors and prospectors were the greatest individual causes of fires.
More intensive patrol will be necessary in dry years.
Settlers fires in prairie provinces require stricter control by an amended law.

The annual report of the Director of Forestry for 1914 as recently issued contains information of decided importance and interest and every reader of the Canadian Forestry Journal should avail himself of a copy.

In the summary, Mr. R. H. Campbell, the Director, says in part:

"As far as control of the fire situation is concerned, the past year has been a very satisfactory one. The proportion of the area of the forest reserves burned over was only two one-hundredths of one per cent, and of the area outside of forest reserves nine one-hundredths of one per cent. While this is largely due to the favourable season, the good result is also due to a considerable extent to the increase in numbers and efficiency of the staff of rangers, to the increased facilities for preventing fire in the forest reserves, due to the improvements such as roads, trails, telephone lines, and lookout stations (which make access to the reserve easier and enable the rangers to reach fires quickly), to the education of the public as to the danger of fire, and to the enforcement of the special provisions of the Railway Act relating to railways. The organization of the work has been more thorough and on the whole, with some exceptions, the personnel of the ranger staff has advanced both in qualification and efficiency. If it were arranged that appointments were made on special qualifications for the work required and that appointments were to be permanent during good behaviour and efficiency, a decided forward step would be taken which should ensure the placing of the staff on a permanent basis of efficiency.

A decided advance has been made in the question of brush disposal after lumbering operations, and it is to be regretted that this branch has not been authorized to take up the matter as it relates to the timber berths held under license in the forest reserves.

Work of Fire Rangers.

In regard to fire ranging, the Director says:

"The fire patrol outside of the forest reserves covers the large extent of more or less forested land from the southeastern boundary of Manitoba through the northern part of Manitoba, Saskatchewan and Alberta, an extent of 205,344 square miles. It also covers most of the Railway Belt in the province of British Columbia. The patrol is carried out as fully as the appropriation will permit, but the large extent of territory involved makes the patrol for each fire ranger very large and the educative work done by the ranger is more effective than the actual work of extinguishing fires.

There were twelve fire-ranging districts, each under charge of a chief fire ranger.

The districts and number of fire rangers employed were as follows:—

The number of fires reported was 511, and the total area burned over was 149,456 acres, of which over one-half was grass-land, so that the proportion of the forested area which was burned over was about nine one-hun-

dredths of 1 per cent. The small extent of the area burned is due to the fact that the season was a favourable one in most districts, but it is evident also that the rangers have been doing more thorough work from the number of fires reported extinguished.

Main Causes of Fires.

Campers, surveyors, and prospectors were the greatest individual causes of fires, and as these are ever changing and therefore the educative work of the rangers has little opportunity for effect, it is evident that a more intensive patrol will be necessary in dry years. Locomotives were the second greatest individual cause of fires,but with a more thorough organization of the patrol on railways which is being perfected each year, this source of danger should in time be controlled, and this would cover the several other causes of fires that occur along the railways.

Clearing of land by settlers is a third great cause of fire, and it is desirable that some change in the provincial fire Act of the provinces of Manitoba, Saskatchewan, and Alberta should be made which would give a better control of this cause of fire, such as is given by the permit system for setting out fire under the British Columbia Fire Act.

I would call particular attention to the statement of the inspector of fire ranging that by far the greater proportion of fires started which are extinguished by our rangers result from the surrounding conditions of the woods as regards slash and débris. This emphasises the fact that one of the most necessary preventive measures in regard to fire is to get rid of the débris and slash from lumbering operations, road-cutting or other work."

Conditions of Logging.

The latter observation of the Director has an interesting relation to the plan followed by the Forestry Branch in disposing of timber on an area of 7,360 acres in the valley of the Clearwater river to the Brazeau Collieries, Limited. Says the report:

"A careful examination of this tract was made by a forester, and it was found that a large proportion of the timber which was of a size suitable for cutting into lumber was over 200 years old and consequently overmature, and that it was advisable that the sale should be made. The tract was estimated to have a stand of 4,500,000 feet, board measure, of timber, and 9,700,000 lineal feet of mining props. This tract was therefore put up for sale by auction, at an upset price of $2 per thousand feet, board measure, for a period of eight years, and the price realized was $2.60 per thousand feet, which bid was submitted by the Brazeau Collieries. The sale was made subject to the following conditions:—

(1) That no trees shall be cut which are designated by the forest officer as being required to ensure the reproduction of the timber, the protection of the watershed, or any other beneficial public service;

(2) That the purchaser shall take out all material that is merchantable from the timber cut and shall not cause any unnecessary waste of timber;

(3) That no unnecessary damage shall be caused to the young growth or to any trees that are designated as not to be cut;

(4) That the débris of logging operations shall be piled and burned or otherwise disposed of in accordance with the instructions of theforest officer;

(5) That the purchaser shall take all necessary precautions to prevent the starting or spread of fire from his operations;

(6) That for fighting fire in the vicinity of, or threatening, the tract, the purchaser shall give, free of charge, the assistance of the men employed by him."

YOUNG PEOPLE'S ARBOR

CONDUCTED BY JAMES LAWLER.

In other issues of the Canadian Forestry Journal we have talked about the different kinds of trees. In this one we will think about the wood that comes from those trees.

No Canadian boy or girl should ever get into the habit of thinking that all woods are alike, or that something is "just wood." Wood is a most wonderful structure, and each kind of wood is fitted for some special use. There is no "best" wood, because the best wood from which to make the back of a violin is not the best wood to use for the keel of a ship and so for other uses.

The Weed Trees.

Canada has many kinds of trees. Some of these in the past we have called "weed" trees, but we are now remembering that a famous man has said that a weed is only a plant for which we have not yet found the proper use. In the last few years we have discovered many new uses for wood so that trees that were once "weeds" are now valuable. As there are many trees for which we still have not found the best use, every Canadian should endeavor to learn all he or she can about our woods, so that we may all assist in finding that use and so that Canada may become a pleasanter, a richer and a more powerful country.

Telling Them Apart.

While boys and girls born in countries that have no forests may be, perhaps, excused from knowing much about trees, would it not be a fine thing if every Canadian boy and girl could say "that is a pine tree," "that is a spruce tree," or upon being shown a piece of wood could examine it and tell whether it is pine, or cedar or maple? If you have not seen the little booklet, "Twenty Canadian Trees," send to the Secretary of the Canadian Forestry Association for one which will help you in gaining one part of this knowledge.

The other part, at present, you must gain from examining different pieces of wood, in and about your home, the furniture, floors, doors, fences, etc., and asking people to tell you. Any carpenter will tell you the names of the different kinds of wood he uses and in many schools there are collections.

How Woods Are Used.

The plan of using different woods for different purposes, while it has been carried further in recent years is not new.

The Bible speaks frequently of wood being selected for some particular purpose as the cedars of Lebanon used in building Solomon's temple and so on. In history we read of the English oak used in the old wooden battle ships, and many battles were won by England's famous archers with their cloth yard bows of yew.

In America the Indians knew the uses of different kinds of wood. In Longfellow's poem, "Hiawatha," the hero thus goes about asking the different trees to give him wood to build his birch canoe:

Hiawatha's Canoe.

"Give me of your bark, O Birch Tree!
Lay aside your cloak, O Birch Tree!
Lay aside your white skin wrapper,
For the summer time is coming
And the sun is warm in Heaven,
And you need no white skin wrapper."

And the tree with all its branches
Rustled in the breeze of morning
Saying with a sigh of patience:
"Take my cloak, O Hiawatha!"

"Give me of your boughs, O Cedar!"
My canoe to make more steady,
Make more strong and firm beneath me."
Through the summit of the Cedar
Went a sound—a cry of horror,
But it whispered, bending downward,
"Take my boughs, O Hiawatha."

"Give me of your roots, O Tamarack!
Of your fibrous roots, O Larch Tree!
My canoe to bind together."
And the Larch with all its fibres,
Shivered in the air of morning,
Touched his forehead with his tassels,
Said, with one long sigh of sorrow,
"Take them all, O Hiawatha."

"Give me of your balm, O Fir Tree!
Of your balm and of your resin,
So to close the seams together,
That the water may not enter
And the river may not enter."
And the Fir Tree tall and sombre,
Answered wailing, answered weeping,
"Take my balm, O Hiawatha."

Thus the birch canoe was builded
In the valley by the river
And the forest life was in it
All its mystery and its magic,
All the lightness of the birch tree,
All the toughness of the Cedar,
All the Larch's supple sinews;
And it floated on the river
Like a yellow leaf in autumn
Like a yellow water lilly.

The Deacon's One Horse Shay.

A very clever observer, Dr. Oliver Wendell Holmes, has put into a humorous poem called "The Deacon's One Horse Shay" the result of the work of a wise old deacon who was determined to build a chaise of materials so carefully selected that no one part would give out before the other. Dr. Holmes writes of the building:

"So the Deacon enquired of the village folk
Where he could find the strongest oak
That couldn't be split nor bent nor broke,—
That was for spokes and floors and sills;
He sent for lancewood to make the thills;
The crossbars were ash from the straightest trees;
The panels of whitewood that cuts like cheese,
But lasts like iron for things like these;
The hubs of the logs of the "Settler's ellum,"—
Last of the timber—they couldn't sell 'em,
Never an axe had seen their chips,
And the wedges flew from between their lips,
Their blunt ends frizzled like celery tips."

After explaining the good qualities of the iron, steel, leather and other materials which went into the carriage he tells how it lasted one hundred years and then says:

"Little of all we value here
Wakes on the morn of its hundredth year
Without both feeling and looking queer.
In fact there's nothing that keeps its youth,
So far as I know, but a tree and truth."

Thus the deacon's experiment was a great success and while we must leave you to find out by reading the poem how the end of the chaise came in one grand smash when everything went into powder at once, yet we would advise you to go over the woods he mentions. See if you can name the trees on the streets or in the woods and if you can identify the wood in the wagon-maker's shop the next time you have a chance to visit one.

No loyal citizen of Northern Ontario will contend that forest fires perform the slightest good service for any part of the community. The prospector, who deliberately sets fire to a forest so as to uncover the rocks, is actually forfeiting for himself and his community the biggest gold mine which the country possesses. He is threatening the employment of hundreds of men, who in a few years, will look to that particular belt of timber to provide them with jobs.-(Smith's Falls News)

FOREST FIRE SITUATION

The year 1915 promises to continue its normal record of forest fire conflagrations in Eastern Canada and the prairie provinces. Reports made to "The Canadian Forestry Journal" from the various parts of the Dominion indicate that frequent rainfalls and the promise of further showers, as prophesied by the weather bureaus, will give safe passage through the usual Fall period of fire risk.

Some bad fires have been reported from the Mackenzie River valley, where merchantable timber and much young growth exists. Details of the damage are lacking at the present time. Outside of this instance, the prairie provinces have had the protection of favorable weather for more than a month past.

Outbreaks in Northern Ontario and Quebec, reports say, have been few and confined to small areas.

Victoria, B.C., Sept. 6, 1915:— Fifty-five fires have been reported this season, some sixty acres in all having burned over, with damage to rather less than three hundred thousand feet of standing timber. Ten of these outbreaks affecting twenty acres, and damaging about two-thirds of the timber mentioned, were due to lightning. Hot, dry, windy weather for the past few months rendered the position one of great hazard, and it is a tribute to the efficiency of the fire-wardens that the losses and fire fighting expenditures have been kept within comparatively small limits. The splendid spirit of co-operation existent throughout this large district has been a valuable asset, several instances having occurred of settlers walking or riding many miles in order to report the outbreak of a fire.

Land-clearing by settlers has been extensively undertaken this year, and good crops are reported generally, especially in view of the fact that many areas are virgin ground, and have been broken up for the first time this year.

Fires have been mainly confined to slashings, with attendant damage to logging camps in a few cases.

GREAT DEMAND FOR BOOKLET

"Twenty Canadian Trees," a booklet of twenty-four pages issued by the Canadian Forestry Association for general distribution, has now reached a circulation of close to five-thousand copies.

Requests have come from every quarter of the Dominion during the past six weeks, testifying to a very live interest among the people of Canada upon such points as the identification of trees, a knowledge of the uses to which woods are put, and other questions briefly but sufficiently treated in the booklet.

Arrangements have been made so that future editions can be provided for school boards, or philanthropic individuals who may desire to distribute copies to pupils in the public schools, churches, etc., at $2.00 per hundred, or if bought in lots of a thousand, $1.50 per hundred. It is believed that many members of the Association may like to secure one-hundred or more for personal distribution. Individual copies will, of course, be supplied by the Secretary without charge to all who send in a request.

PROBLEM OF SLASH DISPOSAL

(Continued from page 196.)

during the periods of early railway construction, relatively little attention was paid to the matter of safe disposal of inflammable debris resulting from construction work and from the annual growth, on rights of way, of vegetation such as grass, weeds, brush, etc. As a result, many large and destructive fires occurred, due to various causes, such as locomotive sparks, coals dropped from ash-pans, carelessness of railway employees and tramps, cigars and cigarettes thrown from moving trains, etc. However, the Railway Act has for years required that the railways maintain their rights of way in a condition free from dead or dry grass, weeds and other unnecessary combustible matter. During the past few years, especially marked improvement has been made in the condition of railway rights of way, and the fire hazard has been correspondingly decreased. However, the hazard is by no means eliminated altogether, on account of the large amount of inflammable debris still remaining on lands immediately adjoining railway property. Such lands include settlers' clearings, timber limits, unlicensed crown lands, and privately-owned forest lands, on none of which has really adequate provision been made as yet for the protection of the public interest through reduction of the fire hazard. In other words, in none of these cases has even an approximation to the same degree of efficiency in reducing the fire hazard yet been secured as in the case of railway rights of way.

(b). **Settlers' Clearings.** Practically everyone (except the settlers directly concerned) now recognizes that it is undesirable to permit settlement on lands where the soil is not suitable for the permanent production of agricultural forest lands have been permitted to be settled in the past, and the practice is not even yet altogether stopped, largely on account of local political pressure. Aside from the direct injustice done limit-holders, and the fact that such settlers cannot make a decent living from their lands after the timber is gone, the practice of permitting such settlements is directly contrary to good public policy, on account of the great increase in the danger of fire spreading to adjoining timber lands. This danger exists also in forested sections where settlement is entirely legitimate, and is due in both cases to the widespread carelessness of settlers in disposing of their clearing debris by burning at unsafe times.

Getting After Settlers.

The province of Quebec has a law forbidding the burning of settlers' slashings during certain periods of the year, except upon permit issued by a forest office. However, the provision for the enforcement of this act is inadequate, on account of insufficient appropriations for personnel, and on account of the difficulty in securing convictions for the offender, or from political interference..

The government of New Brunswick has recently improved the situation in that province through the issuance of a regulation prohibiting the burning of settlers' slashings in the settlements of Hazen and Grimmer, except upon permit from a forest officer. This provision should, however, be extended to the remaining forest sections of the province, and adequate personnel should be provided to make it effective.

In Ontario, there seems to be practically no control over settlers' burning operations, and as a result many serious fires have occurred, causing the loss of quite a number of lives, as well as of probably several millions of dollars worth of timber and other property. There would seem to be no good reason why settlers' slash-burning operations in Ontario should not be closely supervised, with either the establishment of a closed season or of a permit system. The necessity for such action is fully recognized in British Columbia, where a permit system is in effect, as well as in Quebec and a section of New Brunswick. The same is also true of the Dominion forest reserves in the west.

Undoubtedly, the lumbermen, both individually and through their various organizations, could assist materially in hastening the day when action will be taken to remedy the defects to which attention is called above. Various agencies, including the Commission of Conservation and the Canadian Forestry Association, have made repeated representations along these lines, but such reforms come slowly, and continuous pressure from all available sources is apparently needed. A general demand from the public will usually be heeded, while, without it, action may be slow in coming.

Menace of Road Slash.

(c). **Road Slash.** The provinces generally have recognized the fact that slash resulting from wagon road construction in forest sections constitutes a serious fire menace, if allowed to remain piled up along the roadway. Especially during recent years, provision has usually been made for the piling and burning of such debris, at the time that construction has been under way, care being taken to prevent the spread of the resulting fires to adjacent timber lands. As to debris along old roads, the situation is generally less satisfactory, and it will require years to remedy this condition. The above is cited as one more example of recognition that inflammable debris in forest sections constitutes a distinct menace to the public interest, and that measures for its abatement are fully justified.

(d). **Lumbering Slash.** No one will deny that lumbering slash constitutes a very serious fire

hazard, or that in the great majority of cases such slashings burn sooner or later, usually during periods of drought, when the resulting damage to soil, mature timber and young growth will be greatest. The question concerning which the difference of opinion arises is as to what it is practicable to do about it. Since most of the accessible merchantable timber is included within timber limits on crown lands, this is a question which for the most part involves the relations between the limit-holders on the one hand and the respective governmental agencies on the other.

Particularly on lands cut over or about to be cut over, the primary object of fire protection is the perpetuation of the forest, by giving the young growth a chance to mature. In this, the public interest is dominant, and it is therefore logical to expect at least the bulk of the added expense to be borne by the public, or, in other words, by the government. All experience, however, goes to show that, to be practicable, the process of whatever system of brush disposal may be decided upon, should be an integral part of the logging operation, and must, therefore, be handled by the operator. The added cost on existing limits can be very easily taken care of in connection with the periodical re-adjustments of ground rent and stumpage dues, by taking the added requirement of brush disposal into consideration and fixing the money payments accordingly. On this basis, it could scarcely be maintained that a requirement for brush disposal by limit-holders would be a hardship, especially since all competitors, at least within the province taking such action, would be subjected to the same requirements, in which event the market prices would be based upon total costs, which would include brush disposal, and all operators would be on an equal footing.

In the case of licenses to be issued in the future, a provision requiring some suitable form of brush disposal should be inserted in each license, and the tenders made on this basis. There could in such cases be no claim of hardship to the operator, since brush disposal would be figured into the cost of the operation and the payment for bonus adjusted accordingly. This is the basis on which timber sales are handled in the National Forests in the United States, and the plan has worked admirably.

Only a beginning has been made, as yet, in the matter of brush disposal on logging operations in Canada. The question is, however, a live one and will have to be dealt with in the course of time.

On Dominion Lands.

Timber licenses on Dominion Crown lands in the west contain provisions under which brush disposal can be required, though but little advantage has so far been taken of them. The Dominion Forestry Branch, which has jurisdiction over Dominion forest reserves exclusive of licensed lands, has made considerable progress in securing the piling and burning of brush on timber sale areas, which, however, are relatively small in extent. It is, however, unfortunate that no such action has been taken with regard to timber limits on Dominion lands, which are under the administration of another Branch. The desirability of such action has, however, been fully recognized through the insertion of adequate provisions in the licenses, as above noted, and it is only a matter of time until they will have to be made effective.

The province of British Columbia has also recognized the necessity for some form of brush disposal, in order to permit the forest to perpetuate itself. Now licenses and sales contain adequate provisions, and are enforced, and considerable progress has also been made through voluntary action of the holders of older licenses, particularly in the Douglas fir coast region, where the slash is burned broadcast, following a practically clean-cutting operation. Such burning is done either in the spring or fall, when weather conditions are favorable.

In Ontario, some few attempts have been made by the provincial authorities to provide for brush disposal, in connection with new sales of pine, but no denite results have been secured. In this matter, as is the case also in Quebec and New Brunswick, the developments are mostly for the future. Some experiments have been conducted by the Laurentide Company on their Quebec limits, and will be continued during the coming winter. In Ontario, J. R. Booth has taken a distinctly progressive step by piling and burning the debris on a narrow strip through a portion of his limits adjoining the Canadian Northern Ontario railway, east of North Bay, in order to reduce the menace to standing timber. Other limit-holders could well afford to follow this example. Through Algonquin Park, the Ontario authorities have, during the seasons of 1914 and 1915, had a gang of men at work piling and burning the inflammable debris on a strip of land adjacent to the Grand Trunk right of way. This work has been carried forward in co-operation with the railway company, the right of way being thoroughly cleared at the same time. The beneficial results are unquestionable, and the project reflects great credit upon all concerned.

In Quebec, there is promise of an entering wedge, in the shape of a proposed order-in-council, requiring the disposal of inflammable debris in timber limits on a strip one hundred feet wide on each side of railway rights of way. Such a provision would be admirable as far as it goes, but should be so amplified as to cover a much wider range of conditions.

Local Conditions Govern.

In general, it may be stated that no one form of brush disposal should be advocated for all conditions. The method should be adapted to the local conditions in every case, balancing the cost against the results to be secured. Under some circumstances, piling and burning of all debris is justified; in others, it will be practicable only to pile and burn on a strip around the cutting area, thus forming a fire-guard. In some plases, only piling should be advocated, to check the spread of fire. In the spruce-balsam forests of the east, there is much in favor of merely lopping the tops so they will lie close to the ground and decay quickly. Some approximation to this is already reached in the case of an up-to-date pulp wood operation, where the material is utilized in the tops to a diameter of three or four inches. On the other hand, it may be found practicable, in many cases of winter operations on such lands, to pile and burn the debris as cutting proceeds, thus getting rid of the material at once and at the same time at least partly offsetting the additional expense by lowering the cost of skidding. The whole matter is still largely open for further investigation and experiment. In any event, an intensive patrol should be maintained on all cut-over areas, in order to give them an opportunity to restock.

It goes, of course, without saying, that no very great general progress in brush disposal is to be expected during the present adnormally depressed condition of the lumber industry. There is, however, no good reason why some progress should not be made, and there is every reason to believe that with a little more time the whole problem will be worked out on a basis that will be equitable to all concerned. With approximately three-fifths of eastern Canada suited only to the production of wood crops, the country can most certainly not afford to continue to render such lands unproductive, as it has so largely done in the past. All non-agricultural forest lands should be made to produce successive crops of timber, but this is impossible without a radical modification of some of the existing methods for the prevention as well as the control of forest fires.

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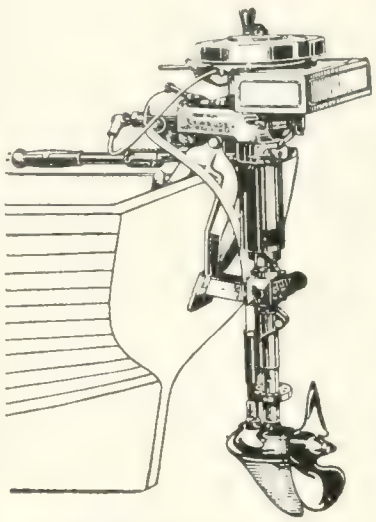

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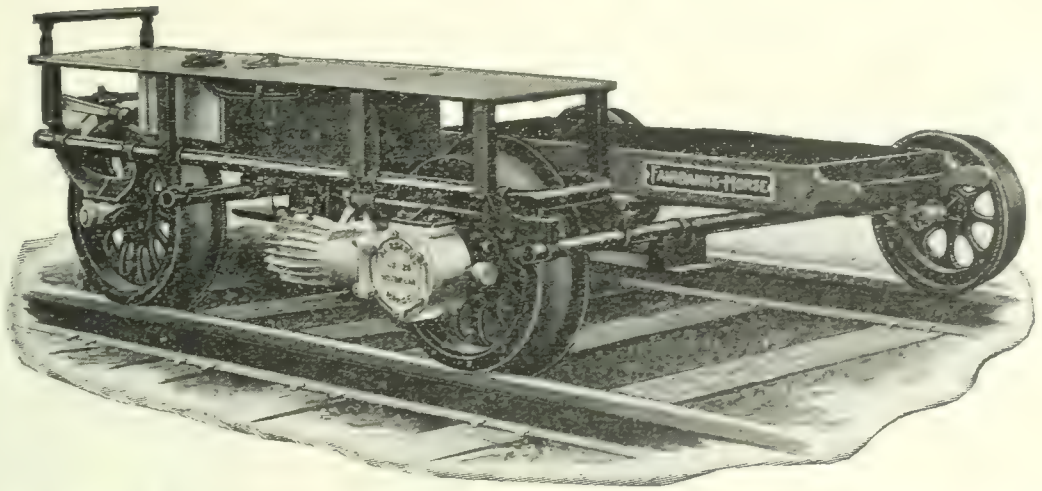
The announcement has been made by Hon. Frank Cochrane, Minister of Railways and Canals, that measures for the protection from forest fires, similar to those required on private lines, are to be taken on Government Railways. On the National Transcontinental a tank car for fire-fighting purpose has been equipped and will be stationed at some convenient point between Edmundston and Quebec. This car has a capacity of ten thousand gallons and is equipped with hose to reach a fire five hundred feet from the track. The question of placing two similar cars at convenient points between the City of Quebec and the Ontario boundary is under consideration. Special fire patrols will also be necessary, and the details are being considered.

Special tank cars for fire fighting purposes constitute efficient means of conserving forest resources along railway lines. The Canadian Pacific Railway has two such cars stationed at Brownville Junction, Maine, where serious fires have previously occurred The Grand Trunk Railway also has equipped a tank car during the present season placing it at Algonquin Park Station, to be used in extinguishing fires along the railway line between Ottawa and Depot Harbor, especial attention being given to that portion of the line within Algonquin Park.

We have no wish to see any person punished for something he did not, in point of fact, intend, but the time seems to have come when those charged with the enforcement of the law will be culpable if they do not see to it that some person, who is responsible for fires through negligence, is put upon trial and, if guilty, made to answer for his negligence in some appropriate way. Such persons are liable not only to punishment, but also to actions for damages by persons damnified by their negligence.—(Victoria Colonist.)



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You leave wife and children behind,
They need men like you at the seat of the war,
And they're not always easy to find.
You're high in the service, you couldn't hold back,
Promotion for you won't be slow,
But when I suggest that I take the same track
You hasten to tell me, "Don't go."

The points that you make in your kindly advice,
For which please accept my best thanks,
Are, I'm not good enough for an officer's job,
And somewhat too good for the ranks,
My job is important, my place can't be filled,
My health isn't up to the test,
There are plenty of men to be wounded or killed,
To stick where I am would be best.
I answer: "The country is calling for men
To battle for freedom and right.
That isn't "Hot Air" from an editor's pen,
We know why we're in this fight.
They all give up something, from comfort to lives.
I've no one depending on me.
Let those stop at home who have children and wives,
Just now—it's worth while to be free.

I've climbed a few hills since the last time we met,
I've hiked many miles through the woods;
The Chief sent me out information to get,
And he says I've delivered the goods.
My wind is as long as the snow peak is high,
What I shoot at I frequently hit,
I think I agree with the medical guy
Who said: "Put your shirt on—you're fit!"
My job is important; I gave it its due,
I let my two mates go ahead.
There's one who will sail in a fortnight or two,
And one by this time may be dead.
I wound up the contract, it looks like my turn,
My chance for returning is fair,
And from me and my comrades old England may learn
The West raises more than "Hot Air."

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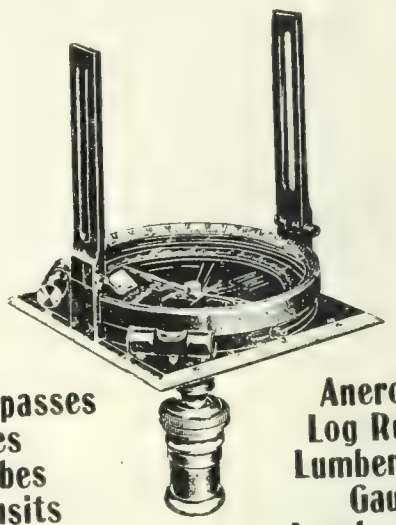

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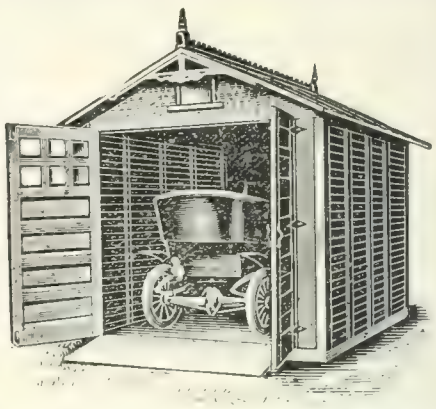

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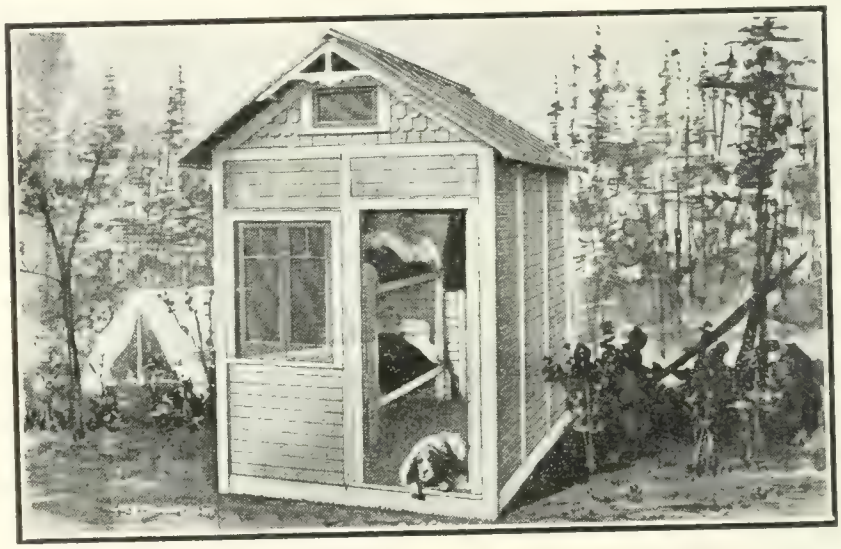

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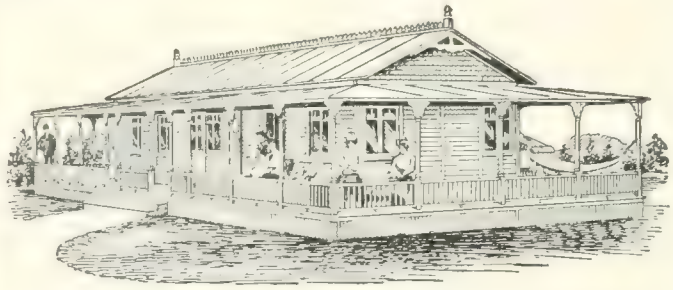

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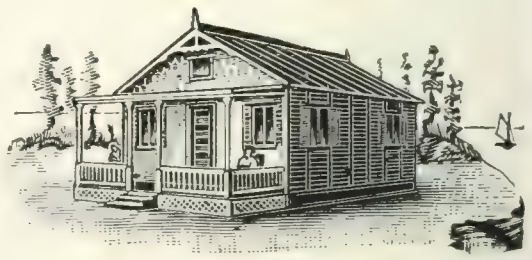

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There seem to be only too many reasons for believing that many of the fires that have happened in the forests, in dried grass and elsewhere in the province this year have been due to carelessness. Probably in practically every instance where this has been the case the people responsible for the fires intended no harm; but there is such a thing known to the law as criminal negligence.

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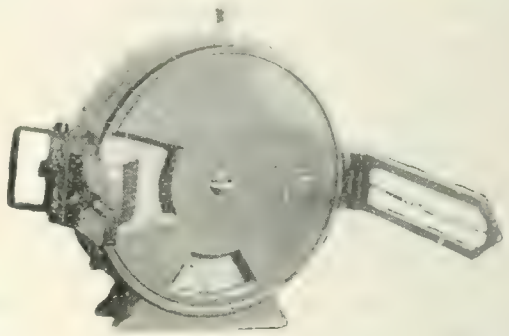

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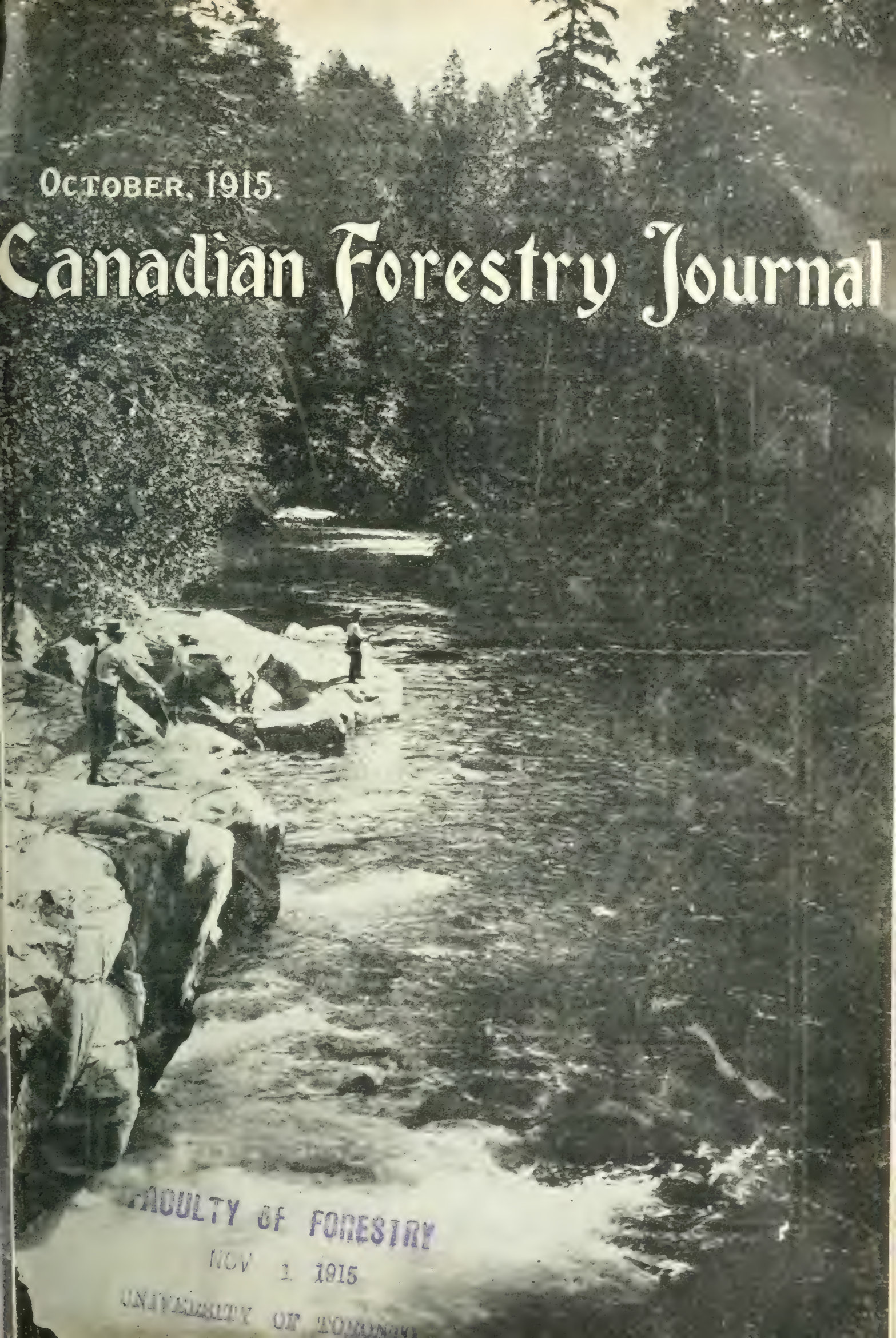

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Vol. XI. October, 1915. No. 10.

HOW THE "PERMIT SYSTEM" WORKS IN BRITISH COLUMBIA

By

M. A. Grainger,

Acting Chief Forester.

In British Columbia the need of regulating land-clearing fires to prevent damage to adjoining timber was recognized almost twenty years ago. In 1897 stringent regulations were inserted in "The Bush Fire Act," which required the construction of suitable fire guards around the slashings, and that the settler should have available a sufficient force of assistants to hold his fire from spreading. Penalties for non-compliance were imposed. Fire wardens were appointed to enforce the provisions of "The Bush Fire Act" about the same date.

After the law had been operative for some time, the provisions were found to be insufficient to control land-clearing fires. In March, 1910, by an amendment to "The Bush Fire Act" the policy of controlling fires by means of permits, was embodied in law. This provision was re-enacted in "The Forest Act," which has been effective since 1912.

Success is Conclusive.

British Columbia, therefore, has had the permit system in effect for six fire seasons, and has maintained a staff each year sufficient to supervise the granting and use of permits. Six years successful experience has convinced practically every citizen that the system of fire permits is a valuable conservation measure.

Burning permits are required over the whole province with the exception of small, well settled communities where the forest areas are much broken up by clearings. Permits are required from May 1st to September 15th for clearing land, for agriculture, and for clearing any debris along roads and railways, around camps and mines, or logging slash. Permits can be obtained only from the regular forest guards and rangers, and Dominion wardens, and municipal authorities who may be granted special power to issue them. Written permits only are allowed and the regular permit form only is used.

Over 11,000 Issued.

In 1914, 346 provincial guards and rangers issued 11,523 permits for burning brush. There is naturally a certain amount of hazard in almost every clearing fire, but so well has the issuance of permits been supervised that in only 128 cases did the fire get away. The permittee must do all in his power to prevent a permit fire getting beyond bounds. Before a permit is issued the guard or ranger inspects the area to be burned to determine whether or not it can be burned with safety, and to see if fire lines have been made around the edge, or in some cases he demands that the brush be piled.

The fact that due care has been exercised is shown by the fact that only one per cent. of the fires set cut under permit got away. In every case this season such escaping fires were controlled with little damage. The permittee is responsible for the control of such fires.

Forty thousand and four acres of agricultural land were burned over under permit during the fire season of 1914, besides 5,727 acres of logging slash, 7,204 acres of slash along railways, and 290 miles of slash along public roads.

Times of Special Danger.

During particularly dangerous periods permits may be refused in the hazardous districts until rain falls. During 1914 and 1915 such temporary refusal has been necessary in various parts of the province.

In general, however, the obtaining of permits is made as easy as possible consistent with safety. Frequent patrol trips on the part of the forest guards, and the arrangement of his trips so that his territory is systematically covered, and so that settlers become familiar with his movements, are the chief means to this end. The forest guard soon becomes familiar with land-clearing operations in his patrol district, and thus is able more easily to be in the neighborhood when permits are wanted. Also his familiarity with slash which he knows the owners desire to burn during the summer, enables him in many cases to recommend burning at a particular time, and by giving the owner a permit at such a time the area is cleaned up while conditions are right. After several years experience an observant forest guard will become expert in burning slash cheaply and safely. Very often he is asked for advice about when to burn, or he may be asked to stay while the burning is done. Such assistance when it can be given is never refused.

Settlers Glad to Help.

In every way slash burning is facilitated by the staff of guards, while at the same time such burning is rendered quite safe. The settlers who are in the majority of cases familiar with the results of bush fires through observation of old burns and through occasional accidental fires which get away, are ready to co-operate to prevent the recurrence of fires. No province in Canada has a better public sentiment in the matter of fire protection. The permit system chiefly has been instrumental in building up this sentiment. The forest guards have often very large districts in their charge (average 500,000 acres in 1914), but are assisted in the work of fire detection through settlers reporting fires by telephone or otherwise, and even by starting fire fighting while the fires are small and before the arrival of the forest officer. British Columbia can properly claim to have already an effective fire protection system, which system is improving ech year. It is undoubted that the fire permit policy is the basis on which the whole system rests, and is the most valuable provision in the fire protective chapter of the Forest Act.

Permits are the Keystone.

It is safe to say that among the settlers themselves 90 or 95 per cent. support this provision, and would resist its elimination. It protects them from the occasional reckless citizen who might otherwise carelessly cause damage. From experience gained in British Columbia, the unqualified statement is made that unless brush burning is controlled by means of permits no real fire-protection is possible in a timbered country. It is safe to say that in no timbered region where permits have been used would the people go back to the old system of indiscriminate and uncontrolled burning.

On the edge of the pine and balsam forest at Oka, Quebec.

THE PINE FOREST AT OKA

The pine forests at Oka, Quebec, are a standing challenge to Canadian municipalities and individuals who permit barren land to remain in a state of uselessness. Oka's pine plantations to-day represent the high practical good that can come from the application of the planting-up idea. Widening sand dunes have been subdued until only occasional sandy ridges along a road side testify to the conditions of a few years ago.

It is especially apropos at this time to refer to the pines of Oka because of the recent death of Rev. Father Lefebvre, the aged priest whose brave spirit was responsible twenty-six years ago for what seemed then a strange undertaking.

The story of Father Lefebvre's planting work forms a strong incentive to develop as far as practicable in all parts of the Dominion the reforestation of waste lands. What was done at Oka may undoubtedly be repeated in hundreds of other localities. Furthermore the handicaps of very limited forestry knowledge and public indifference and opposition experienced by the Sulpician priest need not confront the progressive planter in these days.

Whirlwinds of Sand.

No more engaging description can be given than is contained in the following words which, with the photographs, are from His Grace, Archbishop Bruchesi:

"The village of Oka was exposed to terrible ravages by the sand hills at the foot of which it is built. In my childhood when I used to go to this place to spend some weeks of my vacations, I remember having seen on certain days whirlwinds of sand precipitating themselves from

the sand hills towards the village which was sometimes theatened with engulfment. At other times one might see animals in the barns almost drowned in sand.

"For a long time some means of arresting these veritable avalanches was sought. Engineers had been there. They had studied the problem and been unable to furnish a solution. A priest presented himself,—at that time he was about sixty—and he studied the soil. He asked if it were not possible to plant an entire forest on these moving sands. Certain pages of scientific books had made him believe that the thing was perhaps not impossible. In any case he would try the experiment, and he did try it. With what success? I wish that some fine summer day you would go and see what is now at Oka in place of those sands of which I have just spoken.

"M. Lefebvre engaged Indians and children to go to the distant woods and bring each one little sapling—for there are immense pine woods in this country—for which he gave them two sous or five sous. It was a means of making these young people work. All went to work; they hunted from morning till evening for these little saplings, not more than a foot in height and M. Lefebvre succeeded in planting on those sands 65,000 pines."

Great Results.

Not more than 5,000 out of the 65,000 young trees perished, according to Father Lefebvre's count. Many of them to-day are from 25 to 35 feet high, and being thoroughly protected by the priests of St. Sulpice, and standing in a country well settled on all sides, they will pass to maturity and afford a crop of timber sufficient for all the needs of the community and a means of remuneration for the owners. The main object was long ago achieved; the drifting sands have not only been blocked but are overgrown and over-laid by the forest floor and the new vegetation springing up in the adjacent lands under the forest's protection. The fertile lands about Oka are to-day free from the sand menace and the possessions of the township are the richer by a splendid stand of pine.

"To-day," said Archbishop Bruchesi, "there is a forest with its poetry, with its incomparable charm,

As Father Lefebvre's groves of pines and balsams appear to-day. They were planted by school children on drifting sand and have turned out an asset to the whole countryside.

I know it and I love it, and it is there each year, when I have leisure, I go to pass some days of my vacation; and after having read some books or recited prayers by the borders of the lake, we go into this forest where silence reigns complete to rest ourselves on a veritable carpet of millions and millions of needles fallen from the pines."

RIGHTS OF SHADE TREES

The right of an owner of shade trees to protect them against telephone and telegraph linemen and other forms of interference has caused many anxious questions from members and friends of the Canadian Forestry Association. Recently, a Western Ontario member wrote an urgent request for a statement of his legal rights over his own shade trees which telephone linemen were then hacking to pieces. To his protests, the linemen only replied that they were empowered by law to cut whatever trees they pleased and to any extent that seemed to them necessary in stringing their wires. Needless to say, such a statement has no basis in fact.

The legislation of the province of Ontario in regard to the planting of street and shade trees is, for the most part, contained in "The Ontario Tree Planting Act,"[1] and certain clauses of "The Consolidated Municipal Act,"[2] and subsequent amending acts.

Planting.

Planting by individuals.—The Ontario Tree Planting Act (section 2, sub-section 1) grants permission to anyone who owns land adjacent to a street to plant trees on that part of the street contiguous to his land, so long as the tree or trees do not become a nuisance or obstruct the use of the street.

Trees may be planted along toll roads under the same conditions as along other highways, by the municipal council or by individuals. (General Road Companies Act,[3] sec. 147.)

Planting by Municipal Authorities.—The municipal council of a city, town or village may pass a by-law authorizing the board of park management, park commissioner, or other officer, or three park directors to plant trees on streets or in parks. (Municipal Act, section 574, sub-section 4).

The council of any city, county, township, town or village may expend money in planting or preserving street trees or grant money to any person or association for so doing. (Municipal Act, section 574, sub-section 2c).

Property Rights in Trees.

Trees so planted on highways become the property of the owner of the property adjacent to the highway and nearest the tree so planted. Such is the case also with any tree left standing on the highway. (Ontario Tree Planting Act, s. 2, sub-section 3.)

Bonus for Tree Planting.

The Ontario Tree Planting Act (section 5) provides that the council of any municipality may pass a by-law providing for the payment of a bonus up to twenty-five cents per tree for each tree (of certain species) planted. This by-law must also

[1] R. S. O., 1914, chap. 213.
[2] Edw. VII (1903), chap. 19, s. 574 and 575.
[3] R. S. O., 1914, chap. 210, sec. 69.

make provision for a tree inspector to be appointed to supervise planting and for the protection of the trees against injury or removal by any one (even the owner) except by the authority of a special resolution of the council.

No bonus is to be paid for trees planted less than fifteen feet apart, and the council is not to be liable to pay a larger sum than would be payable if the trees were planted thirty feet apart. (Ontario Tree Planting Act, sec. 4.)

The Municipal Act (section 574, sub-section 1) authorizes the council of any city, town, village or township to pass a by-law giving a bonus of *not less than* twenty-five cents for each tree planted.

[There will be noted here an apparent contradiction in the legislation, the Tree Planting Act stipulating that the bonus shall be "up to" i.e., not more than, twenty-five cents, while the sections of the Municipal Act quoted place the bonus to be allowed at "not less than" twenty-five cents. On writing to the Attorney-General's department regarding the apparent contradiction, the editor received the following reply:

'I would think that the effect of the legislation of 1903' (i.e., the Consolidated Municipal Act) 'would be to override the provision of R. S. O. 1897, cap. 243,' (the Ontario Tree Planting Act).]

Removal, Thinning, of Trees.

Removal of Trees—The council of a county, city, township, town or village may pass a by-law for causing a tree to be removed, if necessary, but (a) it must give the owner ten days notice and recompense him for planting and protecting the tree and (b) any such tree may not be removed, even by the owner, without the permission of the municipal council. (Municipal Act, section 574, sub-section 2).

The municipal corporation shall not be liable to compensate the owner of property in front of which trees stand for their removal further than provided for in the Municipal Act, section 574, sub-section 2 (i. e., for his planting and care of them), provided the cutting and trimming is done under by-law. (Municipal Act, section 575.)

City, town and village councils may pass a by-law authorizing the board of park management, park commissioner or other officer or three park directors to remove all decayed trees and remove and transplant trees and shrubs, after giving forty-eight hours' notice to the owner, and shall not be liable to the owner; but no live tree, unless within thirty[4] feet of other trees may be removed without the consent of the owner of the property in front of which the tree stands. (Municipal Act, section 574, sub-section 5.)

[There is another inconsistency here. The following opinion as to the point was received from the Attorney-General of the province in the letter referred to in the preceding note:

'As to the removal of trees, I think the ten days' notice would be confined since 1903 to the case of a township, as section 574, paragraph 4 gives power to cities, towns and villages to authorize their officers to move and cut down trees on forty-eight hours' notice. If you trace the legislation back you will see how the present condition has been brought about. Paragraph 4 of section 574 was originally confined to cities over 40,000; paragraph 5 of section 574 as enacted by 61 Vict., cap. 23, sec. 19, was confined to a city of over 100,000 inhabitants. In the revision of 1903 the provisions of both these paragraphs were extended to all cities, towns and villages with the effect above pointed out.']

Trimming Trees.—City, town and village councils may pass a by-law

[4] Amended from 'twenty' by 6 Ed. VI, cap. 34, sec. 22.

authorizing the board of park management, park commissioner or other officer appointed, or three park directors to trim trees in parks, or whose branches extend over streets, and are not to be liable for injury to the trees if reasonable care has been exercised in the trimming. (Municipal Act, section 574, sub-section 4.)

The trimming of trees and shrubbery along the highway may be provided for by special rate under the local improvement system. (Local Improvement Sections of the Municipal Act. New.[5] Sec. 3h.)

In cities where a board of park management has been constituted, the powers of the city council with reference to the cutting down, removing, transplanting and trimming street and park trees may be, by by-law of the council, delegated to the board of park management. Municipal Act, sec. 74, sub-section 3.)

Destroying or Injuring.

Any person destroying or injuring (even tieing a horse to) a street tree is liable to a fine not to exceed twenty-five dollars ($25) and costs or imprisonment for not more than thirty days, half of the fine to go to the informant. (Ontario Tree Planting Act, section 6.)

Powers to Pass By-laws.

Under the Tree Planting Act (section 8) the council of any municipality may pass by-laws

(1) To regulate the planting of trees on highways.

(2) To prevent the planting of any undesirable species.

(3) To provide for the removal of trees planted on highways contrary to by-law.

Inspectors of Trees.

An inspector of trees, appointed under the Ontario Tree Planting Act (section 4), must, if required, report annually to the council on the number of trees planted, by whom planted, the amount of bonus due, and certain other particulars. (Ontario Tree Planting Act, s. 4.)

Insect Pests.

Councils in cities may pass by-laws to require owners of trees to destroy tussock moths, and, if the owners refuse or neglect to do so may, after giving ten days' notice, have the work done by officers appointed by them (the councils) at the expense of the owners. (Municipal Amendment Act, 1906, s. 24.[6])

Police Villages.

The Tree Planting Act may be brought into effect in police villages by thirty or more electors petitioning the township council. (An Act to Amend the Ontario Tree-planting Act,[7] passed 1899.) Inspectors of trees may also be appointed, and expenses (bonuses, inspector's pay, etc.) granted.

Linemen Damaging Trees.

A question of much importance and concern to many owners of fine shade and street trees is how they may prevent telephone and telegraph linemen from butchering their trees on the pretext of "pruning" them, under orders from the companies employing them. On this point the same authority as quoted in the preceding editorial notes has this to say:

'I think it is quite clear that the owner would have the right to prevent a telephone company from stringing its wires in a tree planted by him in the street because under section 2 of the Ontario Tree Planting Act such a tree is deemed to be his property.

'I would refer you also to sub-section 547 of the Municipal Act (3 Edw. VII, cap. 19), which gives

[5] 1 Geo. V, chapter 58.

[6] 6 Edw. VII, chap. 34, s. 24. The new provision becomes s. 574a of the Municipal Act.

[7] 62 Vic. (1899), chap. 30. The new provision becomes section 3a of the Ontario Tree Planting Act.

power to municipalities to pass by-laws to prevent the injuring or destroying of trees or shrubs planted or preserved for shade or ornament.

'It is also an offence under section 510b of the Criminal Code to destroy or damage a tree growing in a park, pleasure-ground or garden, or in any land adjacent to or belonging to a dwelling-house, injuring it to an extent exceeding $5. See also section 533 of the Criminal Code, imposing a penalty for damage to a tree amounting to twenty-five cents.

'It was expressly enacted by 4 Edw. VII, c. 10, s. 74, that a telegraph or telephone company should not acquire any easement by prescription or otherwise as to wires or cables attached to private property, or passing through or carried over such property, except by a grant from the owner of the property, so that no matter how long telephone wires have been attached to a tree, the municipality or the owner, if he has property in the tree, could compel the removal of the wire.'

FINES FOR CARELESS SETTLERS

In order to warn settlers in all parts of Quebec that penalties await those who set fire to their brush and slash without first securing a permit, the Canadian Forestry Association through its publicity department sends to seventy-five French and English newspapers accounts of all court cases in which settlers or others have been punished for causing forest fires. These cases are reported to the Association by those responsible for the prosecutions and news-items giving names, addresses, fines, and reasons for the action, are placed in French and English versions throughout the press of Quebec. The co-operation on the part of the editors of daily and weekly journals has been excellent and hundreds of thousands of settlers have read the well-displayed newspaper accounts of court trials and heavy fines.

Prosecutions are conducted by the Quebec Government on evidence furnished by the limit holders protective association and others. Readers of the Journal will realize how practical are the preventive steps taken by the Quebec authorities and by private associations by perusal of these illustrative cases, the result of action instituted by the Lower Ottawa Forest Protective Association.

In the Hull police court before Magistrate Arthur Desjardins on Tuesday, Sept. 28th, Jos. Montigny, of Point Comfort, P.Q., pleaded guilty to setting out fires without a permit and was fined $15 and costs. Gregoire Pichette, Notre Dame de la Salette, P.Q., also pleaded guilty and was subjected to a similar penalty.

At Bryson, P.Q., September 28th, Paul Kluk, Otter Lake, P.Q., was charged with starting his clearing fires without a permit, pleaded guilty and was fined $5 and costs. August Kluk also admitted his guilt and paid the same fine and costs.

At Lachute, before Magistrate Dr. B. S. Stackhouse, Jos. Legare, of St. Jovite, pleaded not guilty and judgment was reserved for eight days. Honorius Ouimet, of St. Faustin Station, pleaded guilty. He was fined $5 and costs of $19.71. Alderic Millette, of St. Faustin Station, pleaded guilty and was fined $5 and costs of $13.90. Jos. Florent, St. Faustin, was fined a like amount and paid similar costs. Victor Racine, at Faustin, pleaded guilty and paid $5 and costs. Methias Lacasse, St. Jovite, paid a fine of $5 and costs. Hormidas Lauzon, St. Jovite, pleaded guilty and was fined $5 with costs.

A survey party of the Dominion Forestry Branch rafting the Wapite River on Musreau Lake trail.

BURNING DOWN THE NORTH LAND

Is Canada paying the price for forest fires?

Read the statements in the following article "In 30 years," says a forest expert, after recently examining a certain area of Northern Canada, "the Dominion has lost through fires about 16,000,000,000 feet, board measure, of merchantable spruce and pine, which at 50 cents per 1000 feet would represent the enormous sum of $8,000,000."

Place against that dead loss the cost of a fire patrol system and who would hesitate to decide which of the two pays?

Many citizens when they begin to take an interest in forest conservation for the first time are eager to stir up some one to start planting or seeding. They are rather impatient with the emphasis which administrators and lumbermen lay on the need for protecting existing forests. They want to see something done toward growing new forests. But the more one studies the forest situation in Canada the more one is impressed with the fact that the first need is fire protection. We still have immense forests ready for the axe. We have forests half grown and quarter grown and for this generation and the next it is of the utmost importance that these forests be saved. In saving the mature or half-grown forest the still younger growth is necessarily being saved too. And, besides, a moment's reflection will convince any one that it is useless

to spend millions or even thousands of dollars in seeding or planting up areas of timber until the public has been so aroused that there is reasonable assurance that these costly areas will be protected from fire and allowed to mature. If we will not protect what we have and what is now immediately valuable what is the use of planting more forests only to be fuel for new flames?

Forest Arson.

It is for this reason that fire-protection systems are organized. It is for this that men are fined for carelessness with fire. It is for this that settlers who have let clearing fires run contrary to law have been sent to jail. Nobody wants an active settler in jail when he ought to be on his land working to support his family, but until the public comes to think of arson in the forest as serious a crime as arson in the city then our forests will burn.

We are coming to realize that you cannot destroy the natural resources of one part of the country without injuring every individual in the country. The most careless settler and the most wasteful lumberman gets something out of the forest and passes on something to others but by far the greatest loss to Canada's timber wealth has occurred in a way that absolutely benefited no one.

The Prospector's Guilt.

Take the Klondike rush of six or seven years ago, that part of the rush that occurred in the valley of the Mackenzie river in what is now northern Alberta. Many of these would-be miners were careful of their camp fires and put them out but the majority cared not a fig for the future, or even for the present so long as it did not inconvenience them, and let their fire run without let or hindrance. There were other prospectors besides the Klondikers and there were careless trappers and travellers generally. The result is that miles and miles of that country covered with fine timber have been burned to a desert. The game and fur-bearing animals have been killed or driven away and the Indians impoverished. Now settlers are coming in to the Peace River valley and they are in danger of facing a shortage in some sections of timber for building and fuel. The trails have been overthrown and obliterated in many places by burned timber. All dead loss and all the result of criminal carelessness.

One of the officers of the Forestry Branch of the Department of the Interior in reporting on an area of about nine thousand square miles speaks of it in the words given below. In itself 9,000 square miles is a large area but it takes up a very small part of the map of Canada. And Canada is suffering a like loss in area after area all over the north country from Ungava to British Columbia. This officer reports:

Fires in the North.

"The results of repeated fires have been appalling. However, the comparative figures and other considerations given below are as nothing compared with the impression the eye-witness receives.

"Over an area of about 8,000 square miles, excluding the prairie land from the total area examined, only 648 square miles or about 8 per cent. have been found bearing a forest cover of 100 yards old and over. These are the only portions which can be regarded as having a virgin cover. Besides this only a little over 8.5 per cent. of the area surveyed, or approximately 700 square miles has been found with a cover from 50 to 100 years old but not averaging above 70 years.

"The total area reported as bearing a small pole-timber, a forest which hardly averages 25 years old, would represent a little less than 14 per cent. of the territory, or an area in round figures of 1,150 square miles.

"The area represented as covered with young production, 1,550 square miles, is certainly a large area, but yet less than 20 per cent. of the whole. The growth covering this area would probably not average more than 20 years old.

"As contrasted with the above areas 4,050 square miles reported as bearing a forest cover of all ages, there is the brule with an area of 3,690 square miles. This area has been mostly swept by fires during the last thirty years. It represents 46 per cent. of the forest territory examined. These figures are far from being exaggerated. Taking in the young reproduction area the percentage of the territory swept by fires during the last 50 years is brought up to about 65 per cent. This is onl ya poor illustration of the conditions prevailing as the immediate result of these fires. In some places the soil cover has been entirely removed and it will take a long time before another forest can take root; in some others the heavy slash endangers the young growth and what little is left of the old forest.

A Record of Thirty Years.

"A very rough but conservative estimate based on the general average of saw-timber production of the forest patches as existing, shows that during the last 30 years, over the territory examined, the Dominion of Canada has lost through fires about 16,000,000,000 feet, board measure, of merchantable spruce and pine timber, which at 50 cents per 1,000 feet would represent the enormous sum of $8,000,000. Besides what about the prospects for the future throughout the same territory? These figures are not given as absolutely exact, they are as near as possible to the truth, and although very conservative they have the advantage of showing effectively and correctly the results of unchecked fires, and the destruction and waste which are the lot of our unprotected forests."

The moral, of course, is that we should get in and protect our forest areas in advance of the prospector and pioneer, so that when the settler arrives there will be timber for his buildings, ties for the new railways and fuel for all.

PUBLICITY AS A CURE

"The Canadian Forestry Association is carrying on an excellent work in connection with their publicity bureau. This was commenced some four or five months ago, and has for its object the distribution of information on forest affairs, and the better protection of forests from fires.

Since the work has started a number of forest protective associations such as the Lower Ottawa and the St. Maurice have co-operated with the Canadian Forestry Association by publishing news items broadcast regarding the prosecution of settlers who have caused forest fires. The publicity given these offenders is having a wholesome effect...An individual may commit offense with impunity so long as he is not found out, but no one desires to get his name in the papers, and to be heralded forth as an offender against the laws of the land. The Association is doing an excellent work, as anything which will tend to lessen forest fires is deserving of the widest support."—Pulp and Paper Magazine, Montreal, Oct. 15, 1915.

WHAT DO WE PLANT?

(By Henry Abbey.)

What do we plant when we plant a tree?
We plant a ship which will cross the sea.
We plant a mast to carry the sails:
We plant the beams to withstand the gales—
A keel, a keelson, and prow and knee;
We plant a ship when we plant a tree.

What do we plant when we plant a tree?
We plant the houses for you and me,
We plant the pillars, the shingles, the floors,
We plant the studding, the laths, the doors,
The rafters and roof, all parts that be:
We plant a home when we plant a tree.

What do we plant when we plant a tree?
A thousand boons that we daily see:
We plant a spire to out-climb the crag,
We plant a staff for our country's flag,
We plant a shade, from the fierce sun free;
We plant all wealth when we plant a tree!

C.F.A. MEMBERS ON ROLL OF HONOUR.

There are a good many members of the Canadian Forestry Association and their sons and brothers in the firing-line in France and Belgium. The first of these of whom definite news of death in the war has come is Mr. Oscar Y. Brown, a young journalist who went to France with the First Contingent. Mr. Brown formerly lived in Ottawa where his father, Mr. J. H. Brown, of the Post Office Department, and other members of the family reside, but during the past three years had worked on newspapers in Montreal and Toronto, and it was at the latter place he enlisted. He was wounded at the battle of St. Julien on May 13th and taken prisoner by the Germans, dying in the prison camp hospital on Sept. 15th.

Mr. Brown gave promise of making a name for himself in the journalistic world and it was in his work that he first became interested in forestry because of his specializing on topics relating to forest utilization and forest conservation. He was highly esteemed in Ottawa and a special service in his memory was held on Sunday, October 17th, at the Church of Our Father with which he had been connected. Of the family that remain another brother is in the firing-line.

TAKES FLYING COURSE

Mr. J. R. Booth, Jr., is in Ithaca, N.Y., where he is taking a three months' course at the Thomas Aviation school, prior to leaving for England to join the aviation corps. The course in flying furnished at the Ithaca school is a most thorough one and on completing it a person is fully equipped to handle an aeroplane of any type. At the school at the present time are twenty-two students from the city of Montreal.

TREES FOR DISTRIBUTION.

The Dominion Government Forest Nursery at Indian Head is now distributing evergreens such as Spruce and Pine for actual farm planting under special conditions. The stock of these varieties is somewhat limited and applications should be made as early as possible. The distribution is, of course, confined entirely to farm planting by bona fide owners and no stock of any kind is supplied for planting on town or city lots.

WHAT THE FORESTS MEAN TO MUNICIPALITIES

By

F. C. Whitman,

President, Canadian Forestry Association.

A little over ten years ago very serious forest fires occurred in Nova Scotia, and in two counties about 90,000 acres were so badly burned that the marks of the fire are easily traced to-day. That these fires should occur year after year meant not only desolation to the districts damaged, but also a menace to the prosperity of the surrounding country and particularly to the municipalities where lumber was manufactured and shipped.

It was just after a year in which forest fires swept the western end of the Province that I was fortunate enough to interest some of the leading lumbermen in a movement to try and put into practical operation an almost obsolete Provincial Act for the protection of woods against fires. It was a rather discouraging undertaking, the public believing that fires were inevitable; and the government placing little value on the timber growing on crown land.

To be brief; we organized the Lumbermen's Association of Western Nova Scotia. We procured acts of other provinces and of the states of Maine, New Hampshire and New York. Legal aid was employed to draw up and submit to the Government of Nova Scotia an amended Bill that we thought would best suit the conditions in this province.

The Act was passed in 1904 and amendments were made in 1905-6, -7, -8, -9 and 1912. It is now the "Forest Protection Act" passed in 1913. All the provisions of this Act are not yet in force, and the appointment of a provincial forester has been urged upon the government. The government has been complimented by high authorities for the adoption of this Act; and it is considered to be one of the best in force in North America. It can be truthfully said that since the Act has been in operation fires have not been so frequent nor so serious, and for my part I feel convinced that with the co-operation of the municipalities backed by favorable public opinion, that it is possible to prevent forest fires, or if fires do start to control and put them out.

The chief rangers and sub-rangers have proved themselves in many cases efficient at fire fighting, and that whereas years ago when no attempt would be made to stop a large fire, because it was thought impossible, the organization is ready to fight any fire and in many serious conflagrations have won out handsomely.

The Claims of Nova Scotia.

You all know the trend of immigration, and the desire of the Dominion Government, very ably assisted by the Canadian railways, to populate the prairie provinces, not only getting people from overseas but also drawing on Eastern Canada. There is a contrast in this settlement that we would do well to point out to homeseekers coming to Canada.

One hundred and sixty acres of homestead land, generally treeless and waterless, for the most part capable of growing only one kind of crop. A settler having to haul water for miles, and eke out a scanty fuel supply by burning straw.

One hundred and sixty acres in

Nova Scotia, and on it you will be almost sure to find the best of drinking water, plenty of wood for fuel, and soil that will grow fruit, grain and vegetables, and pasturage for seven months in the year.

We are getting a few "comebacks," people who have tried the West and missing our Eastern surroundings have sold out their Western holdings and returned to farming in Nova Scotia. The surroundings and advantages if properly put before incoming overseas settlers should capture many more than we are now getting. I am sure we could get neither the Canadian nor the emigrant to come to Nova Scotia if the natural resources we hold in forest and stream were swept away.

I have heard it said that the word "conservation" was a word to conjure with; so I would like to put a meaning to it that would do something more than charm. Constructive conservation and not a preventive conservation is what is needed. Protection from fire first! A knowledge of what we have to protect, and the ability to grow timber of the better kinds, and to make the best possible use of it when it has reached proper maturity!

Conifers Must Be Saved.

How does this matter stand to-day in Nova Scotia? The first cutting in the province was the pine, no other wood equalled it in value. The virgin pine is practically gone, and the cutting of spruce has followed, next hemlock. At the present time the cut of lumber is for the most part spruce and hemlock, with a limited amount of hardwood. The growth of hardwood is almost unlimited, but its usefulness very limited, and at its best is a fourth grade as compared with birch and maple of other provinces. It would be a serious mistake to believe that when the coniferous growth is cut away the hardwood could fill its place.

I feel that I need not go into elaborate statistics to show the need of conservation. In the varied business of the province, manufacturing, farming and building, we all know that schedules of the larger sized timber or lumber that could be readily supplied not so very many years ago could not be filled to-day without importing. In fact we do import, and about seven-eights of the hardwood used in manufacturing in Canada comes from the United States. In our newer houses, you will find British Columbia doors and floors. In bridge construction and wharf building Southern pine is almost exclusively used. Then there is boxing, staves, heading, hoops, and shingles that come in from neighboring provinces.

Stream Flow Injured.

In a general way it may be stated that the annual cut of recent years has been exceeding the annual growth, and that the effect of fires and the cutting away of the forest is making a noticeable diminution in the flow of water in the streams of the province. Mr. Snowball, of New Brunswick, said that a water mill on a stream near where he lived used to saw lumber for four or five months in the year handling the average winter crop of logs. Then a change took place, the water failed, the mill was put out of business. It seemed that settlers had gone in on the headwaters and in a few years had cleared off the land for miles around. The 'never failing stream,' as he expressed it, had become a torrent during the spring freshet, and after that a trickle of water for the rest of the year. I fear that many streams in Nova Scotia will suffer in the same way.

The Government of Nova Scotia has been approached on the subject of the purchase of cut-over and watershed woodland, and to hold it as a protection to the flow of water, but the diversified ownership, private interests, and uncertain surveys makes this a rather difficult problem,

and the initiative must come from the people or the municipalities. I have reason to believe that municipal ownership and protection would work out to better advantage, and give more certain results.

Seeding and Planting.

A few words here about seeding or tree planting. I quote from Forest Protection in Canada, published by the Commission of Conservation in 1912, by Clyde Leavitt:

"On account of the excellent reproduction which generally follows lumbering and fires, the necessity of artificial planting had not made itself strongly felt in the Province of New Brunswick and Nova Scotia. The situation is emphasized by the fact that cut over lands well stocked with young growth can be purchased at a less cost per acre than would be required to stock artificially." I wish to add that pine will follow pine, and the same with other coniferous growth if a fair number of seed trees are left standing. The greater value to the province is in this reproduction, and not in hardwood.

Looking at the matter from a municipal standpoint I do not believe I can do better than to state conditions in my own town of Annapolis Royal. Unfortunately I cannot write so much of what has been done but only to say what might be done. The town owns its water service, and water power electric lighting plant. Both service and power come from the same source on the Lequille stream. The drainage area is 49 miles, approximate head of water at the electric plant is 40 feet, developing 120 horse power. The town owns only a few acres of land and does not control the water flowage, but depends on the natural flow of the brook and providential rains in summer to keep the lights burning. The plant is now operating to nearly full capacity.

The drainage area is cut over land of mixed growth, and there has been of late no destructive fires. Roads parallel the stream, making supervision comparatively easy. I have been advocating that the municipality purchase sufficient of this land to make a protection by letting the young forest grow, and at the same time utilize the wood for the benefit of the corporation. The town uses 70 cords of wood annually for the public school, purchases wood for the poor, and there is also an annual consumption for roadwork, bridges, drains and culverts, and for municipal buildings.

Results Abroad.

The question of course is: Will it pay? and in answer to that I wish to call your attention to municipal ownership abroad. In Switzerland the municipalities not only make a commercial success of such ownership but also make use of their forests as parks. Of 1,564 communities in the State of Baden 1,530 have their own forests. These forests are managed as farms. The lumber is cut at the proper time and every cutting is followed by natural growth or artificial planting of valuable kinds of trees. The city of Baden, of 16,000 population, owns 10,576 acres of forest. The total income averages $100,000 per annum, the outlay is about $33,000, nearly all of which is for labor. There remains each year $66,000 for the city treasury. Forests of this kind have been worked for 100 years and still produce an assured annual cut of wood.

One village has 1,600 population, owns 4,507 acres of forest. The yearly cut is 2,500,000 feet of lumber and firewood; of this all the firewood up to seven cords each is given to the citizens. Two hundred cords goes to the schools and public buildings. The lumber is sold and brings a net income of $21,600. The community is not only free from all communal taxes, but is also able to establish modern works and public buildings. Please keep in mind that the cut of wood does not diminish, the annual income is assured so long as there is no devastating fire.

The examples quoted are not exceptional, they are representative of thousands of towns and villages in Europe. The forest holdings are as small as 160 acres and make proportionate returns. We cannot expect municipal forestry to be as profitable in Canada, but surely with water rights to conserve, and valuable growing forest land so close at hand to many of our towns, this matter of municipal ownership of forest is well worth consideration.

What Could Be Done.

To go back to the Municipality of Annapolis Royal. The town in contrast to the European municipalities, issued bonds and put in its water and lighting systems and made a direct tax for the improvements. From my understanding of the Town Incorporation Act, a municipality can purchase direct or obtain by expropriation all necessary land to se-

(Continued on page 238.)

COAST RANGERS GET TOGETHER

"Get together" meetings of officers and rangers connected with the forest services have been advocated with more vigor than has been applied to their practice. For the past two years, the British Columbia Rangers of the Dominion Forestry Board, with the supervisors of both the provincial and federal services, have held conventions twice a year with excellent results.

On September 29th at New Westminster, one of these friendly and informal assemblies took place and for four hours the men who form the rank and file of the coast district of the Dominion Forestry Branch discussed ways and means as to improvements which might be effected in the methods used for fighting forest fires and so conserving the great wealth of the British Columbia forests.

The meeting might be said to have been Dominion wide in scope, as in addition to officials of the forest service at Victoria, there were present Mr. R. H. Campbell, Director of Forestry for the Dominion; Mr. R. D. Craig, of the Staff of the Commission of Conservation, and Lt.-Col. J. D. Taylor, M.P.

Sawmill men, whose interests are allied to the work of conserving the green forests, were represented by Messrs. R. A. Trethewey, of the Abbotsford Timber and Trading Company, and N. S. Lougheed, manager of the Abernethy and Lougheed mills.

Mr. George D. McKay, Chief Provincial Forester, and Mr. H. Christie, Assistant Forester of Victoria, represented the provincial department, and Inspector Cameron, of the Dominion Branch, was also present.

Onus on Settler.

An important point touched upon and one over which a great deal of discussion ensued, was where best to place the responsibility for the "mysterious forest fires" which it was freely stated were in nine cases out of ten, deliberately set by the settler who, forgetful or careless, of the fact that he might be endangering thousands of dollars' worth of timber, would persist in starting a fire to burn up his "slash," although he had not a permit from the local ranger.

The consensus of opinion was that the occupier of the land where the fire started, should be forced to prove that he did not set the fire, instead of the onus of proof being placed on the ranger or the timber owner. Mr. R. A. Trethewey was emphatic in his declaration that at least 90 per cent. of the forest fires fought by the department annually would be eliminated if the Forest Act were changed to embody such a clause and the majority of the Dominion officials and rangers, heartily agreed with him.

Mr. McKay and Mr. Christie were not so certain that such a change would be practicable, while Mr. McKay went a step further and declared that he was not in favor of such an aggressive policy. "We were all settlers ourselves once, you know," he observed.

Season a Severe One.

Although the season of 1915 will go down in the history of the coast department as one of the severest years in the matter of forest fires, the aggregate loss to timber is relatively slight. The season was exceptionally dry and up to the end of August the local rangers had fought 257 fires of which total 166 occurred in the months of July and August. Ten thousand acres of slash and logged off lands were burned over, principally in Surrey municipality

WORTH PROTECTING?

Here is shown a stand of British Columbia timber. Why settlers should be allowed to imperil such superb assets in any part of the Dominion is difficult to understand. British Columbia's system of permits for settlers goes far to end a long-standing evil.

yet in that district, according to the reports of Chief Ranger James Selkirk, no loss of standing timber was sustained, although a certain acreage was scorched. It would be logged before the effects of the scorching did any real damage.

Tribute to Rangers.

Inspector Cameron, in his address, paid a high tribute of praise to the work of the rangers under Mr. Selkirk, when he stated that never in the history of the forestry service the world over, had the record of the

men in the coast district for 1915 been excelled.

Mr. Campbell also complimented the men for the efficient work and he said the steady increase noted in the efficiency of the Dominion forest service must be credited very largely to the rangers.

The conservation of forests was a serious business, he pointed out, one that demanded the best in each man and the duties of a ranger did not consist of merely fighting the fire, but of educating the people of his district to a realization of the value of forest conservation.

In Europe, said Mr. Campbell, the forestry departments had fire protection down to the highest degree of efficiency, had in fact learned all there was to know on the subject, and could now turn their attention to other matters. Places that not so long ago were huge sand wastes, were now green forests, protecting thousands of acres in vineyards which had once been barren lands.

Two Vital Factors.

Mr. R. D. Craig said the Conservation Commission was endeavoring to secure an accurate estimate of the value of the timber in the province. Nine-tenths of the province was being utilized in the growth of timber and the necessity for its conservation could be seen by comparing the area being used for agricultural purposes which formed the other tenth.

Mr. E. W. Beckett, who presided, said the careless setting out of fires by settlers was a very grave question, in fact it was getting so bad that some drastic measure was necessary and he favored a change in the act if possible, so that the onus of proof would be on the settler to show that he did not set the fire on his land.

THE FOOL AND OUR FOREST DOLLARS

By E. T. Allen,

Forester, Western Forestry and Conservation Association.

Good-by to the fool with the empty gun;
Forgotten his bid for fame.
Though he kills his friend, it only counts one,
And that, nowadays, is tame.

The fool who playfully rocks the boat
Is on the front page no more.
He may rank high with the fools afloat
But his glory is gone ashore.

There's the fool with women, the fool with wine,
And the fool who games with strangers,
And the joy-ride fool (he does well in his line
By combining these ancient dangers).

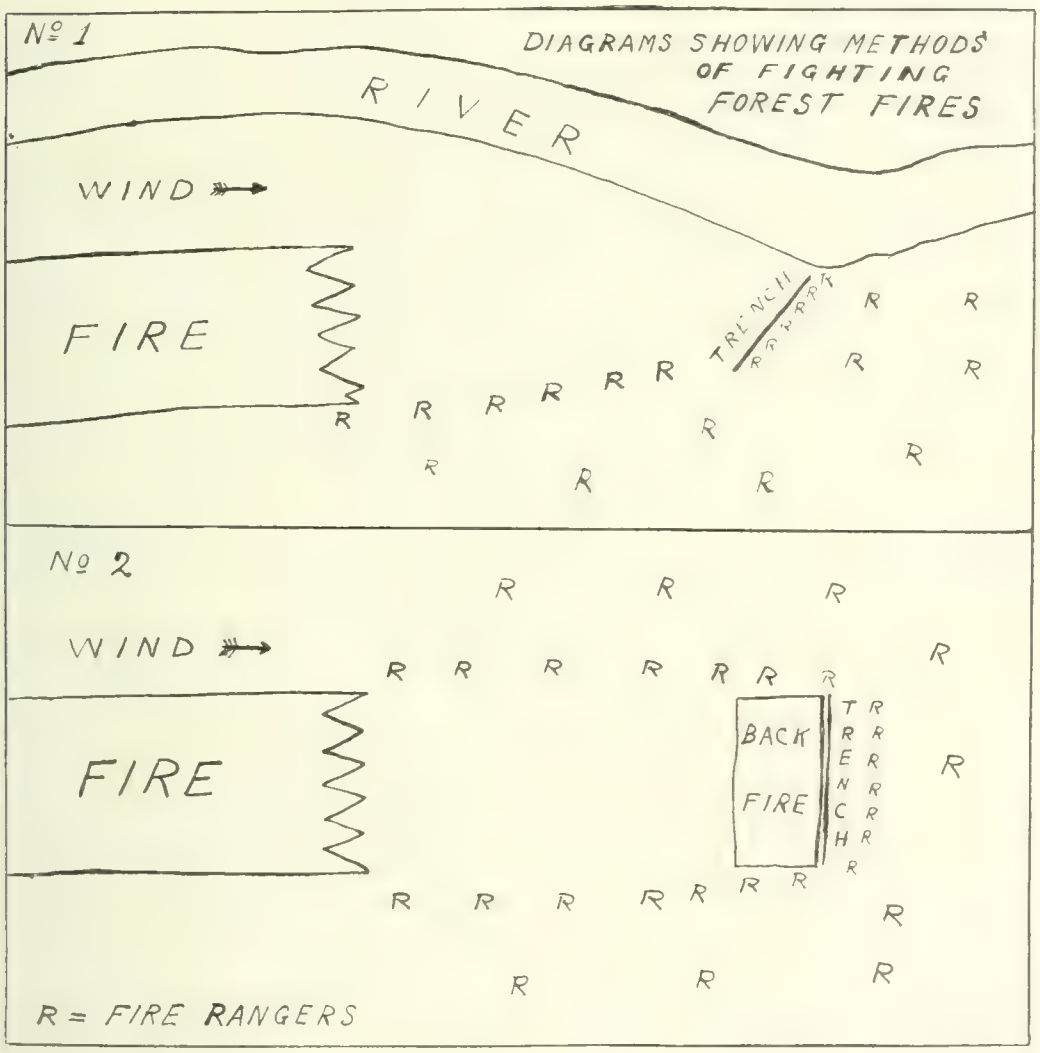
But they're all still down in the primer class,
Mere novices taking a flyer,
Compared with the prize-taking criminal ass,
The fool in the woods with fire.

A few hearts break for the deeds they've done
In their pitiful amateur way,
But fire slays dozens where they slay one
And scourges a state in a day.

For the ruined home and the smokeless stack
And the worker unemployed
Know a hundred years shall never bring back
The things that his match destroyed.

YOUNG PEOPLE'S ARBOR

CONDUCTED BY JAMES LAWLER.



Once when the writer was lecturing on forestry in a large public school in a certain Canadian city, the magic lantern broke down. While new connections were being made the principal of the school suggested that the pupils might like to ask some questions. Usually at such lectures before grown-up people questions are few in number and come slowly, but in this instance the children were ready with many questions, and some of them were very searching.

One boy asked: "In your lecture you speak of men fighting a forest fire but when a forest fire really gets started is it possible for men to do anything but look on?"

We speak about questions being "pertinent" or "impertinent." (Look up the words in the dictionary if you are not sure of their meaning). This was certainly a very pertinent question, and, as a second lecture was delivered in that school, the diagrams which you see on this page were made and the question answered with their aid at the next lecture.

Forest Fires and House Fires.

The question was pertinent for the reason that a forest fire is in some respects very different from a

fire in a town or city. Most of us are only too familiar with the sight of firemen dashing to a fire, putting up their ladders and rushing up with their hose to swamp out the fire with water. Forest firemen also go as fast as they are able to the scene of the fire but as they have to go in canoes, or along bridle-paths over stumps and stones, it is impossible to take along a fire-engine. And even if one could be taken along it would be useless because forest fires generally occur where there is no water near by.

The question was pertinent again because anyone who has ever seen a small patch of forest burning knows that men are not able to stand for a long distance in front of the fire, that is in the direction in which the wind is blowing the heat and smoke.

Yet in spite of lack of a good supply of water at hand and in spite of the smoke and heat men do fight forest fires and bring them to a stand and finally put them out.

Like Cattle Stampedes.

How do they do it?

They do it in some respects like a cowboy stops a frightened, stampeding herd of cattle.

Out on our prairies in Alberta and Saskatchewan, when a herd of cattle stampede and start to rush across the country like a dozen express trains gone wild, no cowboy endeavors to stop them by riding out in front of the herd and shouting and waving his arms. The herd would trample rider and horse just as they would a clump of sage brush. The cowboy in such a case rides up alongside the foremost steer and keeping up with him gradually crowds him over towards the centre of the herd. This steer crowds over on the next and so on until the whole herd gradually turns slightly in that direction. The cowboy keeps up the process, crowding and crowding, till presently the whole herd, without knowing it, is travelling in a circle. They travel around and around until they tire themselves out and the stampede comes harmlessly to an end.

Fight from the Sides.

In the same way the forest fire-fighters crowd the fire in at the sides narrowing its front and turning it toward some natural obstacle as a river, a swamp, a steep hill, etc.

If you will look at diagram No. 1 and suppose that all the country is covered with forest you will see how fire-fighters work. The fire is travelling in the direction of the arrow. The fire-fighters designated by the letters "R, R" are spread through the forest in the direction of the wind to put out fires which may be started by sparks blown from the fire. A line of firemen edge the fire toward the river and at a convenient place a trench is dug down to the mineral soil and all the leaves, grass and brushwood scraped out of the way. The idea is that when the fire reaches the trench it will die out for want of something to burn.

How Do They Use Water?

How do the men edge the fire over?

They beat it out with green branches or with bags and sacks soaked in water. The water is carried from the nearest creek or river in canvas buckets and used very sparingly, for often it has to be brought some miles. Where horses can be used the water is carried in canvas bags attached to the pack saddle. At the trench sometimes common water-pots, such as are used in gardens, are employed to sprinkle the ground and stop the advance of the fire. In other cases the canvas water-bags are fitted with sprinkler nozzles and are used like watering pots. Most of the water however is used to saturate the bags and the clothes of the fire-fighters.

How Back Firing is Done.

In the second diagram the fire is shown in a forest region where there

is no river or lake. The fighters get on both sides and endeavor to narrow in the front. Then away in advance a place is selected where the fire will go slow, such as the crest of a hill, and here a trench is made. Unlike an army a forest fire is irresistible in charging up hill while it is at its weakest in charging down hill. The trench is therefore dug just over the crest of the hill, where the fire will pause before it starts to go down. In addition to the trenching the men sometimes make a "back-fire." That is they go a little way on the windward side of the trench and start a fire in the grass twigs and leaves which fire they stop when it reaches the trench. If there is time they go still farther back and start another fire which dies out when it reaches the burned ground. Then when the main fire reaches the burned space it will have so little to live on that it can be stopped by the fighters at the trench. As in Diagram No. 1 rangers, as far as they can be spared, are placed through the woods to put out sparks and embers blown from the main fire.

In Battle Order.

This is a general description of how fires are fought. But fire-fighting is a war, and, as in military warfare, each battle must be fought on its own merits. The successful general is he who best selects his position, who posts his forces in the most strategic positions and who gets the assistance of natural obstacles to stop the rush of the enemy.

This is work that requires training, sagacity, endurance and courage. Our Canadian fire-fighters are exhibiting these qualities more and more every year, and as good citizens we should strive to learn more about them and to back them up in every way we can in this patriotic work.

THE ORIGIN OF FIRES.

(Montreal Herald)

"The Canadian Forestry Association is making a determined effort to awaken public feeling in regard to the numerous fires with which the forest regions of Canada are devastated every year. While a good many preventive measures are already in effect, it is evident that the Association believes the authorities are still far from doing their full duty in the matter of supervising the settlement of forest areas and of preventing the numerous fires consequent on settlement. There can be no doubt that a very large proportion of the fire ravages caused every year are the direct result of the carelessness of settlers and prospectors and the Association is doing an excellent work in impressing this upon the authorities."

ALBERT GRIGG CHOSEN.

Mr. Albert Grigg, M.P.P., for Algoma, was appointed Deputy Minister of Lands and Forests, succeeding the late Mr. Aubrey White. Mr. Grigg was born on May 9, 1873, in the county of Huron. He was educated at Bruce Mines, of which place he later became Mayor. He is a pioneer of the Algoma district, having filled many public positions there. For three years he was license inspector, for one year Reeve of Plummer township, and for two years the Mayor of Bruce Mines. He was first elected to the Ontario Legislature as member for Algoma at a bye-election in 1908, and subsequently re-elected at the general elections of 1911 and 1914. He quickly gained a reputation as a forceful and interesting speaker and was regarded as one of the most promising members of his party. Mr. Grigg is progressive in spirit and has a thorough acquaintance with the conditions in the forest districts of his province.

CHURCH AIDS IN PROTECTION

As a result of representations by the Canadian Forestry Association, His Eminence, Cardinal Begin, Archbishop of Quebec, has kindly consented to address the people of all the parishes of the province making clear their duty in the prevention of forest fires and asking their co-operation.

The letter of His Eminence to the Secretary of the Association reads, in part, as follows:

Archbishopric of Quebec,

1st October, 1915.

"His Eminence the Cardinal-Archbishop of Quebec has charged me to assure you that he is deeply interested in the matter which is the object of the work of your Association.

"How regrettable it is, indeed, to learn so often that our forests are devastated by disastrous and costly fires! This constitutes often an irreparable loss of vast portions of our national wealth.

"More than once, the Archbishop of Quebec, at the request of the honourable ministers of Crown Lands, has authorized that in the churches of the Archdiocese circular letters be read concerning the protection of forests, that which has also been done in other dioceses.

"To accede to your desire and to that of your Association, and in order to prevent as much as possible, in the future, the destruction of our forests, His Eminence has instructed me to assure you that he will seize the first favourable opportunity to remind, not only the settlers but all those who, for some reason, travel over the forests, of the obligation to observe the law which deals with this important matter, and also of the duty of justice devolving upon all, requiring of them to look after the conservation of this part of our national wealth. In accordance with the desire you have expressed in this connection, these warnings will be made in the churches.

"His Eminence hopes that these notices and the efforts of your Association will produce the desired results.

"Respectfully yours,

"JULES LABERGE, Pst.,
Secretary."

HOMESTEADING ON TIMBER LAND

The Editor of the Journal has received a letter from Hon. Jules Allard, Minister of Lands and Forests in the Quebec Government, discussing the article which appeared in the September issue under the title of 'A Colony of Fake Settlers.'

The Journal article on the fake settlers was written after a personal inspection of parts of Boyer, Campbell and Robertson townships, and the gathering of information from several authorities who had known the conditions in these sections intimately for many years back. The article was quite explicit in stating that no one who knew the progressive forest policy of the Quebec Government had any doubt that a stop would be put to the further homesteading of non-agricultural land.

Hon. Mr. Allard's letter makes

clear that his department during his term of office has allowed no lots to be sold in Boyer and Campbell in sections which the Department records mark as "non-agricultural." By an oversight, the name of Robertson township was not used in the article although much of the description was based upon that area, particularly upon the lots bordering the Devlin Road between Mont Laurier and Maniwaki.

Apparently, the words: 'for some reason abuses beyond all common sense are allowed in the township of Boyer year after year' was read by Hon. Mr. Allard as meaning a perpetuation of the fake settlers by cognizance of the Department. What the sentence wished to imply was that no matter in whose administration the fake settler had been admitted to non-agricultural lands, he should be ousted as quickly as possible and without consideration for his protests.

"I have before me," says the Minister," a list of lots sold within the last three years in Boyer and I find that there are only sixteen, three during 1913, 11 during 1914 and two during 1915, and all these lots with the exception of lots 36 and 37, 3rd range, sold during 1913, are situated in a colonization reserve created about twelve years ago, after an inspection had been made of the land bordering the Gouin road. Lots 36 and 37, 3rd range, sold during 1913, although not comprised in a colonization reserve are situated only about one mile from the road leading to Rapide de l'Orignal, a distance of about three miles from said place.

"Ever since I assumed the direction of the Department of Lands and Forests (1909), all my efforts have been directed with a view to suppress this fake settler evil, which not only exists in the Province of Quebec but in all the other Provinces of the Dominion and even in the United States. Thanks to our organization, which is composed of licensed forestry engineers, we may congratulate ourselves that if we have not completely suppressed the evil complained of, we have at least reduced it to a very considerable extent and with more success than in any of the other provinces."

"The above remarks," adds the Minister, "apply also to Township Campbell where we have sold 4 lots during 1913, 9 during 1914 and 1 during 1915."

READING CAMP ASSOCIATION.

During the past month the Secretary of the Canadian Forestry Association arranged with the Reading Camp Association, of which Rev. Alfred Fitzpatrick is superintendent of camp education, for the distribution of from thirty to fifty copies of the Canadian Forestry Journal each month in the reading tents maintained by that body. Other literature on forest questions of a helpful, educative kind will be supplied the Reading Camp Association as it is issued.

Mr. Roy L. Campbell has resigned the editorship of "The Pulp and Paper Magazine" of Canada to become Secretary of the Canadian Pulp and Paper Association.

British Columbia Rangers M. V. Allen and F. B. Edwards, of the Canadian Mounted Rifles, are at Shorncliffe.

"The question of the protection of our forests from fire is first of all a question of morals; to burn useful material without any reason for burning is immoral."—Dr. Fernow.

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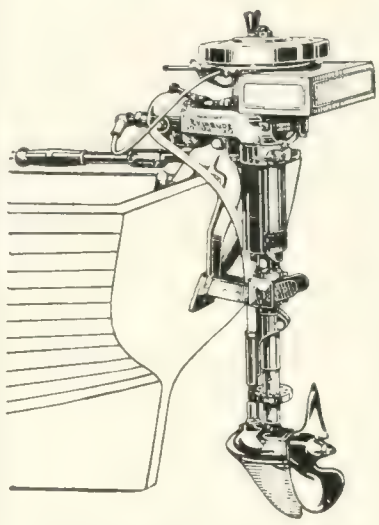

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(Continued from page 229.)

cure a supply of water for consumption or power, and in this case could obtain possession of several thousand acres of forest land extending from 5 or 6 miles on each side of the Lequille stream which now supplies water to the town. The Forest Protection Act would permit of the appointment of resident sub-rangers in daily touch with the property and which should be the means of eliminating the fire risk. Under the supervision of one man this property could be worked to paying advantage from the date of purchase. It would give employment to the indigent, particularly in the winter. The town would get its firewood and lumber, etc., at first hand. It should be the direct means if properly looked after of relieving taxation and provide a future income to the municipality. Other towns in the province are similar to Annapolis in having all the conveniences of a modern city, but held down to the fraction of a cent in the tax rates, and urgently need some other source of revenue, than a direct personal and property tax.

The foregoing formed part of an address delivered recently by Mr. Whitman before the convention of the United Municipalities of Nova Scotia, at New Glasgow.

The Canadian Society of Forest Engineers, with headquarters in Ottawa, has been granted a provincial charter. The corporation, which is without share capital, is for the purpose of advancing its members in the theory and practice of forestry by the discussion of technical and professional topics, to promote a better mutual acquaintance among Canadian foresters, and to take such steps as may appear to be advisable for the object of promoting in Canada the interests of the forestry profession as a whole. The incorporators are Dr. B. E. Fernow, Dean of the Faculty of Forestry of Toronto University, Robt. H. Campbell and Clyde Leavitt, of Ottawa, Ellwood Wilson, of Grand Mere, Que., G. C. Piche, of Quebec, Que., Norman McK. Ross, of Indian Head, Sask., and H. R. MacMillan, of Victoria, B.C.

V. K. Wood, forest clerk, who left Victoria with the 48th Batt., is at Shorncliffe.

NEW BRUNSWICK NOTES.

Robert K. Shives, of the class of 1913, after taking instruction in the Curtiss school of aviation at Toronto, qualifying as a second lieutenant in the flying corps, left for England where he hopes soon to receive the rank of lieutenant in the Royal Flying Corps. It is believed that his nerve and resourcefulness will win him rapid promotion.

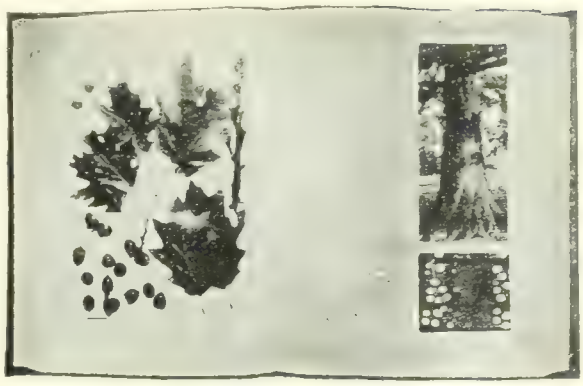
Robert K. Melrose is now in the employ of the New Brunswick Land Company, doing forestry work. Chris. Armstrong has been in charge during the absence of Mr. Reginald R. Bradley on a short vacation.

Mr. Hal B. Murray, of the class of 1913, is now District Forester at Cranbrook, B.C., where about a year ago he was assistant. The force at Cranbrook consists of District Forester, under whom are three rangers.

C. E. Maimann, Leland Webb, Reginald Jago and Guy Horncastle, who were in the employ of the Dominion Forestry Branch, have returned to the University, the three former taking up the work of the senior year and the latter of the junior year. There is good promise of the largest senior class ever graduated from the institution.

Col. T. G. Loggie, Deputy Minister of Lands and Mines, left on Oct. 12th for a trip of two months to Western Canada and before returning will visit the Panama-Pacific Exposition. He was accompanied by Mrs. Loggie. During his absence from the Crown Land office his work will be taken by Mr. McMullen, a former employe of the office.

Prof. R. B. Miller, of the University of New Brunswick Forestry Department, delivered an address before the combined teachers Institute of Kings and Queens counties at Hampton, N.B., on the evening of October 21st. His subject was: "Forestry in the Public Schools."



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Russia now occupies first place among the nations of the world in the extent of its timber resources, the value and quality of two-thirds of which are practically unknown. The total area of the empire is about one-seventh of the land surface of the globe, and 39 per cent. of it is under forests. Those in European Russia cover an area of 474,000,000 acres; in Finland, 50,500,000 acres; in Poland, 6,700,000 acres; and in the Caucasus, 18,600,000 acres; a total of 549,800,000 acres, exclusive of Siberia. In the Ural Provinces, forests cover 70 per cent. of the area, and in the four lake Provinces 57 per cent. It is estimated that in western Siberia alone there are 465,000,000 acres of virgin forests, and eastern Siberia, while not so richly endowed, has sufficient timber to supply the world's demand for years to come.

The Government owns 285,598,941 acres of forest land in European Russia, 12,826,387 acres in the Caucasus, 360,519,435 acres in Asiatic Russia, and 288,742,000 acres in the Amur region, a total of 947,686,763 acres. Twenty-three per cent. of the forest land belonged to landed proprietors and 9 per cent. to the peasantry in 1910.

The principal timber lands of eastern Siberia are in the valleys of the Amur River system, which cover an area of about 200,000,000 square miles. Of this area, only about 400,000 miles is considered available for timbering, but according to local calculations, allowing 45 merchandable trees to the acre, this would give some 11,520,000,000 trees. As the time required for these trees to mature is placed at 100 years, 115,200,000 trees could be cut per annum without diminishing the forests, with proper reforestation methods.

The Russian Forestry Department places the total timber land in Siberia at 810,000,000 acres, of which two-thirds can be successfully placed on the market.

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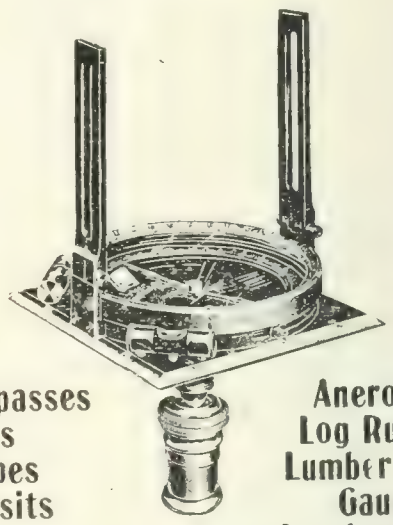

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Readers of the Canadian Forestry Journal can do a good service to the Association and the cause of forest protection generally by asking their local Librarians to place the Journal on their 1916 subscription lists. The Journal already goes to many public libraries in Canada and the United States, but should be on all public reading tables in this country.

Ask your librarian at the first opportunity to secure the Canadian Forestry Journal and other publications of the Association, all of which can be done for one dollar a year.

Forest Assistant O. J. Sangar, of the Lillooet Division, has volunteered for active service and hopes to leave for England with his battalion.

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The following books are suggestions. They are worthy of your inspection. Send for copies to-day, and be prepared to meet the various daily problems.

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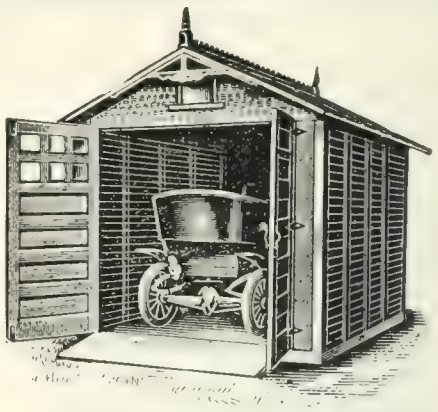

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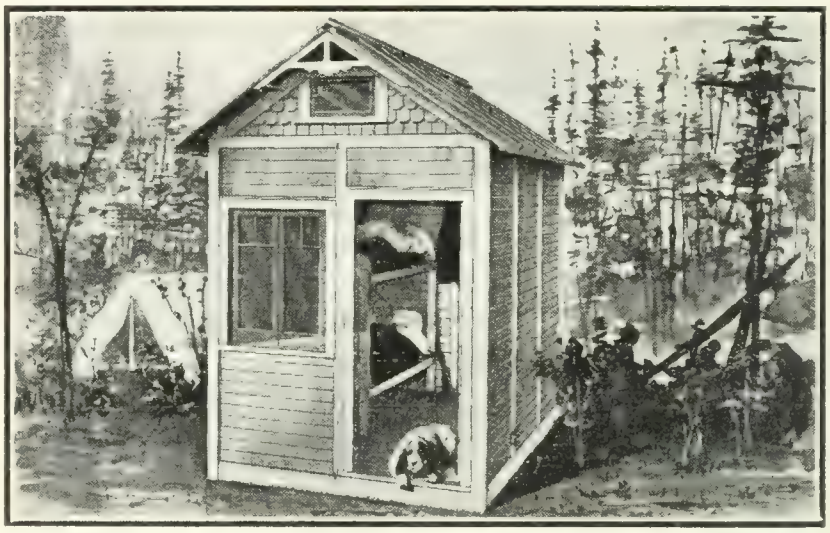

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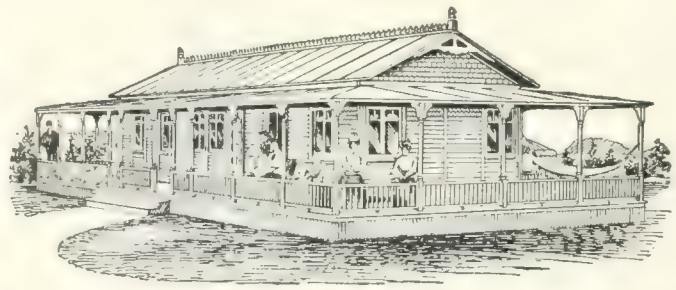

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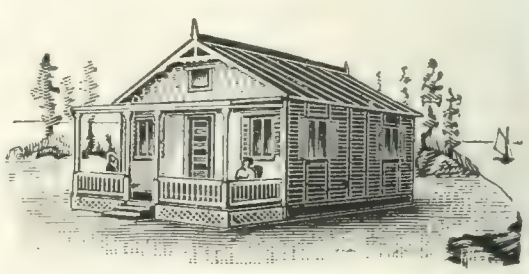

REINDEER EXPERIMENTS

According to the annual report of the Dominion Forestry Director, the herd of fifty reindeer purchased by the Government from Dr. Grenfell has now been reduced to four animals, all females, and it is proposed to try and cross these with the native caribou. The great difficulty has been with the bulldog flies in the summer. These attack the deer and irritate them to such an extent that they break out of their corral and scatter into the bush. The herds of wood bison, on the other hand, seem to be increasing and now number probably five hundred head. They are well protected and should increase rapidly.

COSTS OF BRUSH PILING.

In the Forest Reserves in Saskatchewan the Government has required brush piling and burning on all timber sales, and while there was a little opposition at first, this was soon overcome and now it is a regular procedure. Mr. Gutches, lately in charge of this work, gives the following figures of costs: With wages at 25 cents per hour the average cost per acre was $1.00, average cost per cord five cents, average cost per thousand feet board measure ten cents. On another operation, where 16,178 ties were made but the lopping was not done till after all the ties had been removed, the cost for lopping and burning was one cent per tie or 31 cents per thousand feet. This cost would have been much less had the lopping and burning been done at the time of cutting. Brush burning should certainly be made a routine part of every logging operation.

A PROGRESSIVE STEP.

Mr. J. R. Booth, of Ottawa, has caused the piling, ready for burning at a safe time, of inflammable debris on a narrow strip of his limits parallel to a portion of the Canadian Northern Ontario railway, east of North Bay. This progressive action in connection with forest fire prevention will materially reduce the fire hazard to valuable timber lands in the vicinity. Similar action by other limit-holders would undoubtedly be a paying investment.

Some of the government fire-protective agencies have given attention to the general situation caused by the accumulation of logging debris in proximity to railway lines. The Forest Act of British Columbia provides that the Provincial Forest board may declare inflammable material which endangers life or property a public nuisance, and may order its removal.

In Quebec, the provincial government has under consideration the issuance of an order-in-council requiring the holders of licenses on crown lands to dispose of inflammable debris on a strip one hundred feet wide, adjacent to railway rights-of-way. Such action will well accord with the progressive attitudes of the Quebec government toward the conservation of its forest resources.

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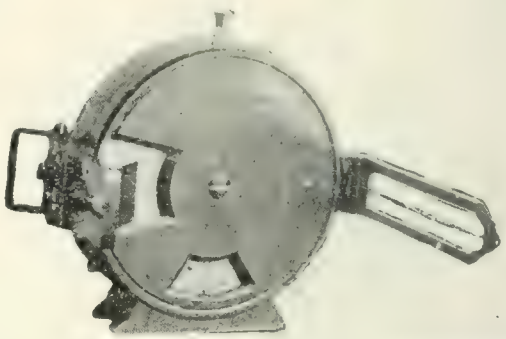

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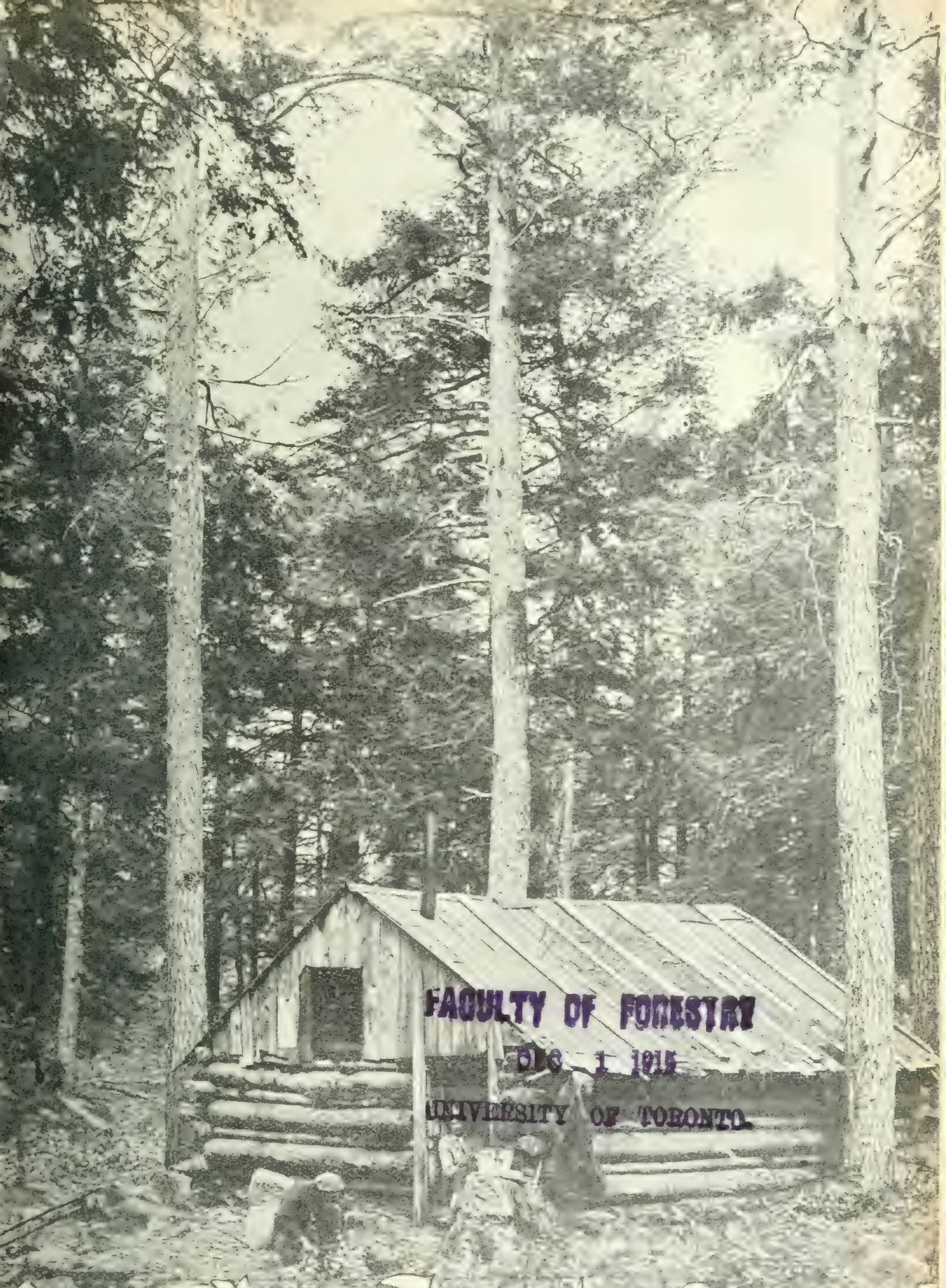

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Canadian Forestry Journal

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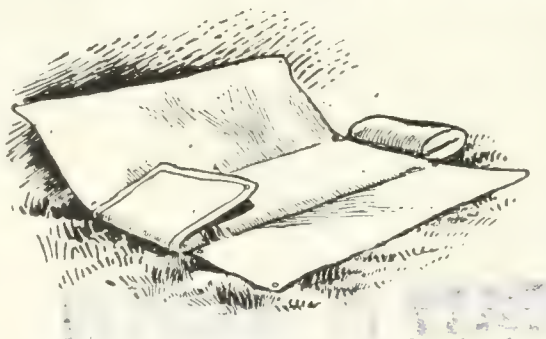

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Canadian Forestry Journal

Vol. XI. November, 1915. No. 11.
(Printed at Kingston, Ont.)

THE WORKING PLAN OF THE ST. MAURICE PROTECTIVE ASSOCIATION

How 12,000 Square Miles of Valuable Limits Are Kept Free From Serious Loss.

By Henry Sorgius, Manager.

FACTS FROM THE ST. MAURICE.

In 1914, 80 settlers' fires occurred; in 1915 41 fires.

Twenty look-out stations have been erected and in another year all will be connected with telephones.

Four hundred and six miles of telephone line have been constructed.

One hundred and sixty-nine fires were extinguished in 1915.

In the fall of 1911, the leading lumbermen of the St. Maurice Valley met to discuss forest protection. In former years, certain limit holders in this section were dissatisfied with the patrolling system that existed at that time as a few of the companies totally neglected to place men on their limits to guard them against fire.

These lumbermen then agreed to form a forest protective association, the ranging to be governed by one head. This was done and in March, the provincial charter was obtained and the first meeting was held on the twentieth of March.

The Manager took up his duties on the above date and preparation for the season's work was commenced. The various offices of the associate members were visited and much valuable data and maps were collected. The name of probable fire ranger inspectors and fire rangers were taken and placed on file.

The motor car in forest protection has proved an economy in the St. Maurice territory. It is said to cost less than a horse for upkeep, everything considered.

Dividing the Country.

At the directors meeting on April 6th, a working plan was presented. The territory was divided into three divisions.. Each division was subdivided into districts. Each division was under the supervision of an inspector whose duties were to see that the rangers in his charge cover their respective districts during the dry weather and cut out and clean trails, erect look-out stations and string telephone line during the wet season.

In 1913, more limits were added to the Association and another inspector was employed to help with the work. In 1914, two more inspectors were added to the force to help oversee the ranging in our ever-increasing territory. In one division this past season, the inspector did his inspecting in a Ford automobile where ever there was a road leading into the ranger's district. The auto has proven that it was a good investment as it has cost less to keep up than a horse.

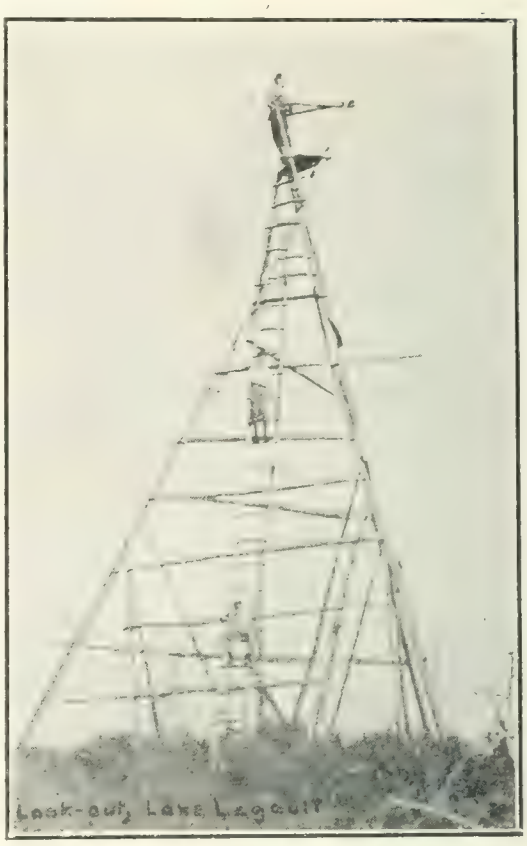
Method of Patrol.

Each district was patrolled either by two men in a canoe, a man on horse-back or a man on foot. The very best of results were obtained by this method. The sizes of districts that rangers have to patrol are determined according to the fire hazard in that particular centre.

The total number of acres patrolled by the Association to date is 7,892,766 or 12,332 square miles.

This last season, the rangers patrolling the settled districts, were furnished with dodgers in the early spring which asked the settler to cooperate with us in the burning of his slash, thereby lessening the fire danger.

Colored dodgers were also printed and, as in the case of the plain ones, a house-to-house canvas was made and each and every man in the various parishes under our supervision, received one of them. Circular letters were written to the Curés of these parishes asking them to kindly explain to their people just exactly what we wished them to do and the penalty for disobedience. Splendid results were obtained by this method and by the use of burning permits as the following record speaks for itself: 1914, 80 fires; 1915, 41 fires. This shows a clear decrease of about fifty per cent. in the fires. Two more years of this system, and the settlers will be accustomed to our method of controlling the burning of slashings. We firmly believe that at the end of this time, very few settlers will trouble us with fires.



A look-out tower at Lac Legault.

Railway Guarding.

The section that is traversed by the National Transcontinental Railway is also patrolled by us. A distance of one hundred and sixty-seven miles is under our control. Five motor speeders, two men to a car, follow up all trains in their respective districts, twenty minutes after their departure.

This past season, all fires caused by engines, were thirty-five in num-

ber. These fires were all extinguished by our rangers without the aid of extra labour, excepting one small fire.

Equipment was purchased for fire fighting purposes such as pails, shovels, grub hoes and axes. These articles were distributed to the various inspectors and were placed at most accessible points.

Look-out stations have been erected throughout the territory at the most advantageous points, i.e., points of observation which aid us most in patrolling the more dangerous fire centres.

We have found that an observation, placed at points which overlook settled territory and territory inhabited by river drivers is a money-saving scheme in more than on way. It helps to cut down our staff of fire patrols and still retain the proper efficiency of forest patrol.

Twenty Look-outs.

At present, we have twenty look-out stations erected and by the end of next season, we hope to have all the stations connected by telephone lines.

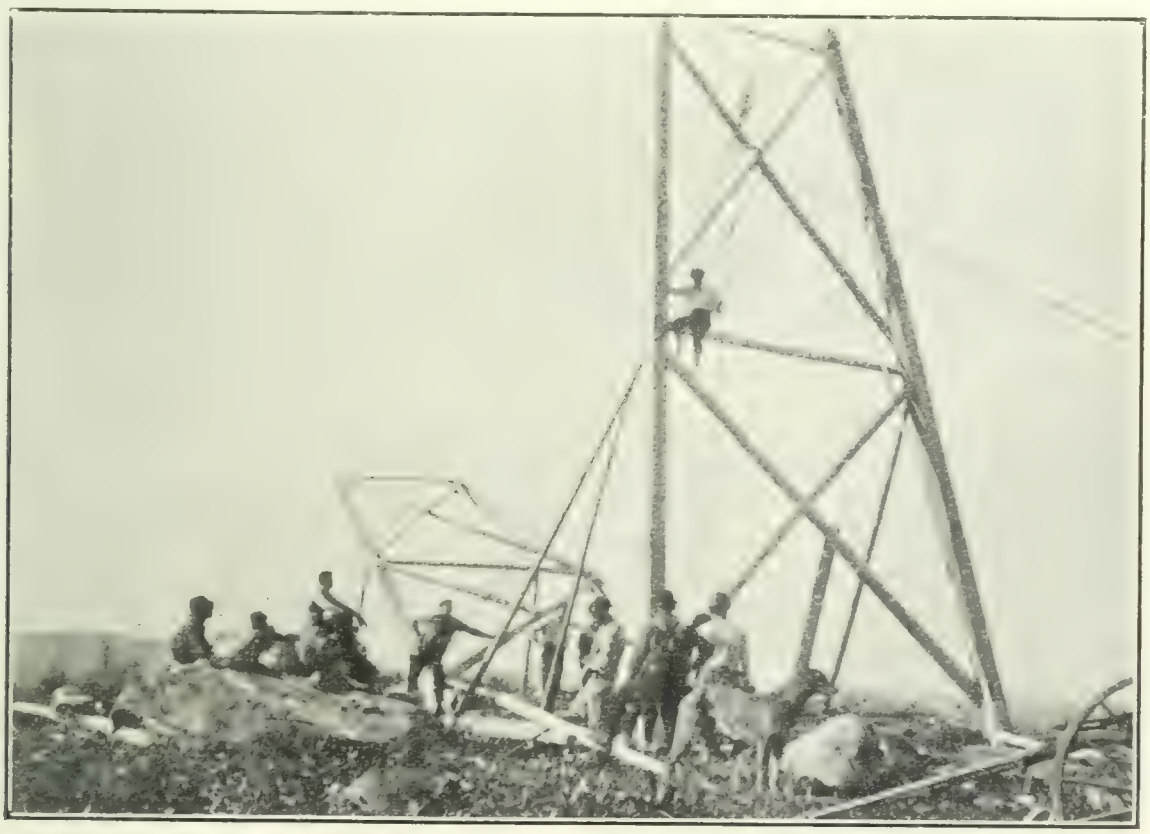
To date, four hundred and six miles of telephone line has been constructed. The telephone has proven a great boon to forest protection and much valuable timber has been saved from fire by its timely use.

During the season of 1912, the employees of the Association put out one hundred and eight forest fires. The season was a wet one. In 1913, three hundred and five fires were extinguished. This season, as were the seasons of 1914 and 1915, was a very dry one with long droughts. In the season of 1914, two hundred and thirty-one fires were extinguished and in 1915, one hundred and sixty-nine fires.

The cost of patrol has never exceeded one quarter of one per cent. per acre since the Association has been in existence.

Cheap Protection.

It has been proven conclusively that the limit holders have been given cheaper and more efficient patrol and protection by the co-operative system than by any independent method which has ever been tried out in this section.



Rangers of the St. Maurice Association constructing a look-out station at St. Michel Des Saints.

LOSSES ALONG H. B. RAILWAY.

Serious Record of Forest Destruction Owing to Lack of Appliances and Official Supervision.

The Hudson Bay Railway, which is directly controlled by the Department of Railways and Canals, has been responsible for very serious damage to forest growth during the construction season of 1915. One estimate places the loss at $250,000, and the area burned over at 500,000 acres. If these figures are even approximately correct—the fact forms a serious comment on the methods which have been allowed to prevail in connection with the H. B. Railway's construction.

The area traversed by the new line is not, of course, heavily timbered, but there is considerable jack pine, spruce, black spruce and birch, averaging from 4 to 40 inches at the butt, along the waterways and on islands. Certainly it is the only timber available to settlers and sawmills which will be expected to come into the country upon the opening of traffic. There is little doubt that if prospective farmers were told that the forest growth in the neighborhood of the road had been turned into a bon-fire, they would hesitate to accept even free land under the handicaps of importing their fuel and lumber.

It has been commonly accepted that no Canadian railway can be run through new country without ruining during the period of construction a great part of the timber upon which so much of the freight revenue of the future depends. This belief has been justified by nothing more than the frequent instances of official indifference to the importance of forest preservation.

Whatever the reasons may be, the facts are indisputable. In 1914, the Canadian Pacific, Grand Trunk System, Canadian Northern and all other company-managed roads in Canada caused the burning of 191,000 acres, valued at a little over $400,000, of which about half represented the value of merchantable timber. It is difficult to understand why a few hundred miles of new Government line should approximate the damage of 25,000 miles of private-owned line. Indeed there exists no reason whatever for such a showing except that the Hudson Bay road was not equipped with the fire-prevention appliances imposed by law upon the private companies, and supervision of contractors and men was not enforced.

During the construction of the National Transcontinental through Quebec, a part of the line was patrolled by the limit holders in cooperation with the contractors and with the Department of Railways and Canals and the Quebec Government. Very little was burned in this section, although destruction was considerable in the area outside of it. So was it with the Canadian Northern construction through Northern Ontario. From the first survey to the completion of steel, forest destruction was held down to a minimum, the company being determined that modern ideas of forest preservation should prevail. Great assistance was given the C.N.R. in this section by the rangers of the Ontario Government.

Here were two great precedents for the building of the Hudson Bay Railway, and yet neither was applied. It is possible that the forest growth in Manitoba adjacent to the

right of way may have appeared too inconsequential to justify expenditures on protection. At the same time, it is all that the district possesses and is the sole hope of larger timber in the future. Thirty years will not restore to the burned lands the wood supply that existed before the railway arrived and that same wood supply is of the highest importance to successful settlement.

A Proud Record For Canadian Foresters

Probably no other profession in this country is able to show such a percentage of enlisted men as that of forestry.

Very clearly, the motives actuating the foresters who have left their employment to take up arms were of the highest type. In nearly all the cases of which we have record, the men left well-paid positions in order to accept the hardships and dangers of military life.

A rough estimate made by one of the professors in the Faculty of Forestry, Toronto University, places the number of foresters engaged in the practice of forestry or allied occupations at 62 and the number enlisted (to October 20th) at 20.

Of 71 undergraduates in Canadian forest schools, 27 have enlisted.

In other words, of the Canadian foresters engaged in their profession, 32 per cent. have enlisted, while of the undergraduates 37 per cent. have enlisted. The two combined show an enlistment of 35 per cent. which in view of the two per cent. enlistment for the entire country is probably a greater percentage of enlistment than from any other profession in Canada except army men.

This estimate leaves out of consideration entirely a large number of men engaged in forestry work, such as rangers and non-professional supervisors, many of whom have enlisted, and it also leaves out of consideration foreign-born foresters in professional work in Canada, of whom there are about 15.

Canadian Trees to mark Heroes' Graves.

The loyalty of the rangers stationed at the very outposts of the Empire and a remembrance of the fact that 22 permanent and four temporary men have enlisted from the Dominion Forestry Branch was evidenced in the following resolution by the rangers' convention at Revelstoke, B.C., relating to a collection of the seeds of all the trees native to the region made for the purpose set forth:

"This meeting respectfully requests the Director of Forestry to forward the collection of seeds of Revelstoke trees collected by Ranger Smythe to the Minister of Militia with the request that these be forwarded to the proper persons in France who will undertake to plant them on the graves of Canadian soldiers who have fallen in the defence of the Empire."

SENTIMENT MAKING AND FOREST PROTECTION.

By

E. T. Allen,

Forester, Western Forestry and Conservation Association, Portland, Oregon.

If every citizen knew the truth about forest preservation and use, understood the economics of forest production and what governs the conduct of lumbermen, comprehended the power and responsibility of state and government, realized his own relation to these problems and what conduct of his own would best serve his welfare and the community's; then there would be little use in discussing most of the topics before this meeting. That they are vital topics is because they are questions of human conduct, either in or out of the lumber industry, yet are given proper consideration by too small a proportion of the people whose conduct is involved. We are unsuccessful in any of our aims only where we hold a minority belief. Minority belief is lack of public sentiment. Therefore we succeed or fail exactly in the measure of our ability as sentiment makers. The certainty and speed of accomplishing any result dependent on human action are measured by the degree to which the desire for this result, and knowledge of how to get it, approach being universal.

That is all there is to it and it applies to forestry and fire protection, to public encouragement of proper business organization, and to finding a market for our product. Such a fundamental factor in the success of human endeavor has not escaped deep study anywhere except in forestry industry. Princes, priests and politicians have always lived by it; psychologists and advertising experts have reduced it to exact science. Forest industry has long suffered by its operation against us, first through hostility or indifference toward forest welfare generally, and lastly through its employment by our competitors. Yet although we have smarted under this, only very lately have we realized that it has been our own fault; that we have deliberately left to others the one great instrument that all must wield or perish. And now that we are taking it up belatedly, is it reasonable to suppose we can succeed without learning the principles which govern its use? The object of my talk here is to warn against such a belief. We will waste much effort, perhaps do real harm, if we assume that sentiment making requires nothing more than our native intelligence backed by some money. It requires experience and system as much as any other undertaking; probably more than most because, while we can learn many things by our own failures and successes, no man alone can observe all the workings of the human mind in different environments. He must borrow from the experience of others and do so with great discrimination.

The Laws of Sentiment.

I shall not attempt a complete exposition of psychologic laws and all the detail of their application to forest propaganda. I do hope, however, to set you thinking on two distinct propositions. One is that there are certain laws which govern all

The paper from which the accompanying excerpts were taken was delivered recently before the San Francisco Forestry Meetings.

appeals to public sentiment. The other is that any sentiment campaign, if successful at all, develops successive stages of response which demand progressive treatment. The appeal requisite in a primary stage may be dangerous in an advanced stage.

All kinds of people exist, in different mental states. There can be no best way at all. There may be certain principles you wish to impress upon all, but different approaches are required to make the strongest appeal to each. Moreover, class or vocational sympathies or prejudices vary the original receptiveness toward your proposition. Consequently it is seldom possible to select any single form of appeal to which all effort should be devoted. Beware of selecting a plan which strikes you most strongly and abandoning others seemingly less strong. You are always a poor judge, for the man in a house cannot tell how it looks from the outside. Try your favorite plan by all means, but also try others.

Feeling and Opinion.

There is a sharp distinction for publicity purposes between feeling and opinion. Opinion is, or believes itself to be, based upon reason. Feeling, or emotion, is not. We can never expect any great unanimity in reasoning, for capacity and motives very greatly, but feeling may be practically universal. A nation can never agree on any opinion, but it can have a common hatred. You can influence opinion only by fact or argument and feeling only by feeling. This distinction is known by all who successfully sway the crowd. Use logic where opinion is against you and you have favorable conditions to present it, but appeal to emotion where conditions do not give logic attentive and receptive hearing.

Furthermore, emotional man cannot reason. Temporary emotion prevents even a logical man from reasoning. Hence never try to combat a prejudice with logic. Remove the prejudice first, by some counter-appeal of similar nature.

In dealing with either reason or emotion you must remove any fixed idea, leaving the mind temporarily open, before instilling a conflicting idea. To attack an idea directly with a contrary one produces irritation and often impregnable repulsion.

Irritation is particularly to be avoided. It causes resentment to the whole subject thereafter. A false appeal by any of us, causing suspicion or resentment toward the kindred things we work for, may destroy other efforts by any of us. Contrary-wise, every favorable stroke makes the next easier, just as hypnosis is easier with each repetition. When one hears a piece of music begun, he is unprejudiced. If it contains a jarring note, he is on guard thereafter; but if it soon develops a pleasing bar he is favorably disposed toward what follows. Consequently we should conduct all our sentiment-making; whether for forestry, lumbering or markets; with tact and recognition of each other's special problems.

The Sense of Justice.

It is usually possible to convert a man to any fair point of view in which he originally feels no personal interest. In such a case he is swayed almost wholly by outside presentation and also inclines, as far as his information permits, to be strictly just. All men like to be just as between others. With themselves they cannot so easily perceive justice or, if they do, accept it. Consequently it is always best to appeal to a hearer for justice between ourselves and a third element, or between him and a third element, but not between us and the hearer. Usually any appeal can be framed, with a little ingenuity, in accordance with this principle.

Consider also the difference of the country mind from the city mind. City people see little but the effect of human power and therefore believe it omnipotent; that human command or laws can make their existence happy or intolerable. They are the prey of the class agitator. Moreover they are accustomed to take orders, if not from direct employers or foremen at least in the form of placating those to whom they sell their services or goods. Country dwellers make their own decisions in their daily life. They also see bigger forces than human laws—the seasonal cycles, flood and drought, unyielding natural laws—and avoid the mob mistake that nothing can stand before the will of power or numbers. Property owning is also in itself steadying, cultivating sanity and self-control. Therefore, while country people are liable to certain prejudices incident to narrow outlook, they are also less vulnerable to crazes and false argument, more responsive to logic if properly presented. City people are more reachable by emotion, emphatic command, and the suggestion of prestige. In fire preventive effort this distinction is further intensified by differing familiarity with the subject. The country dweller knows the ground and demands sound argument. The city dweller is not sure of himself in the woods, so inclines to accept any emphatic command.

Where Sentiment Changes.

I have not attempted to cover the whole ground but merely to indicate the nature of psychologic laws we should study. Their adaptation also involves continual inspection of changes of sentiment, for the public mind, or any section of it, may pass from one class into another requiring different treatment. If we are successful, this is sure to happen.

For example, we began some years ago with almost complete indifference to forest protection. It was useless to urge care with match or camp-fire, for the ordinary citizen did not care whether the woods burned or not. Our educational work was therefore directed toward showing the relation between forest preservation and his personal interest. We have succeeded in this, generally speaking. Few people but who believe forest destruction is a bad thing. The same argument on posters and elsewhere that got results then is offensive now to many because it assumes their ignorance and lack of public spirit. They resent our telling them what they pride themselves on knowing already. Irritation results and hampers all our effort.

Yet fires occur and prove that although people may have the right idea they don't know how to practice it. They want to be careful, yet don't think of the right thing at the right time. What they need now is not argument, but latent suggestion of a definite act, that will awake when they handle a match, leave a camp fire, or look at slashing.

If this is true of the majority, we should be foolish to plan a poster without recognizing it. Yet there remains a minority still requiring the old argument and certainly demanding our attention. How can we reach them without irritating the others? By argument and suggestion combined in one poster and with the primer class argument so indirect that it does not offend the advanced grade. There are two ways at least of doing this. One is a flattering appeal to the advanced grade for help with the primer class, the other to give some detailed information to prove your point which the advanced grade is excusable for not knowing. This is the best method to-day.

Dealing with Irresponsibles.

Eventually will come the stage when the majority having good intent and also drilled in method will include practically everyone who

can be reached by any appeal. There will still remain the irreducible minimum of criminal and hopelessly irresponsible. For these there will be no method but sharp command and warning, to some extent effective because it is a very direct suggestion and to some extent because it also suggests penalty in a way it does not now. For by that time forest protection will have become conventional and the ordinary citizen will consider himself behind the notice, not its object, and the offender will know this to be the case.

I have only touched on some of the fundamental principles of sentiment-making. Its detail becomes even more complex and dependent upon study and experience. The relative values of different mediums and how to use them; comparative costs; style of writing for different purposes; mechanical effects in printing and cartoons; devices to attract interest; all these are tricks of the trade in which originality counts but much must be patiently learned. It has been tabulated by psychologists that we remember nine-tenths of what we say and do; seven-tenths of what we do; five-tenths of what we say; three-tenths of what we see and hear; two-tenths of what we hear, and one-tenth of what we see. This is getting the sentiment-maker's margin down pretty small, for he depends mostly on getting a share of the last tenth. It means that if forest welfare is to hold its own in competition on this basis, it had best get out of the amateur class and learn all it can of the human mind as well as of forest fires and sawmills.

B. C. FOREST FIRES.

Aproximate figures compiled in the Vancouver timber office show that the extent of the bush fires in the Vancouver district this year was the worst in thirty years. When it is known that 236 reported fires burned over an area of 113,254 acres during this summer, some idea of the extent of the problem confronting the forest department during August and September will be given. In 1914 the number of fires was 140 and the acreage 21,550, while in 1913 there were only 42 fires and only 120 acres burned over.

ILLUSTRATED LECTURES ON FOREST SUBJECTS.

A series of illustrated lectures is now being arranged by the Secretary of the Canadian Forestry Association to be given by him through the months of December, January, February and March.

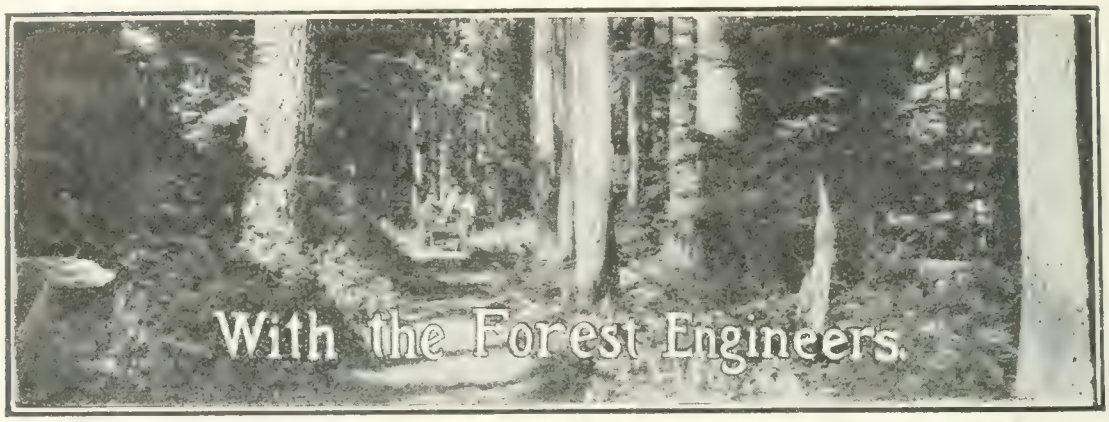
The Secretary will gladly consider requests for lecture dates from members and friends of the Association.

All expense in this connection is met by the Association, with the exception of local hall rents, advertising, and similar incidentals.

Several hundreds of excellent stereoptican slides are available, as is also a lantern.

ONTARIO'S FOREST REVENUE.

Ontario's revenue from lands, forests and mines will this year reach, if not exceed, the sum estimated—$2,000,000. Last year the receipts from these sources, on account of the disorganization created by the war, fell short of what had been anticipated before hostilities broke out. This year's estimate seems to have been based pretty much on what was received last year. According to Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines, there has been an appreciable improvement so far as the lumbering is concerned, the American market, which was to some extent panicky twelve months ago by reason of the war, having proved better.



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Most of those engaged on the survey parties sent out by the Dominion Forestry Branch last spring have returned to the East. C. E. Maimann, who was in charge of the Central Manitoba Survey with Assistant L. S. Webb, have returned to the Forest School of the University of New Brunswick.

The Eastern Manitoba Survey party, conducted by J. D. Aiken, assisted by H. A. Porteous, have returned to the forest school at Toronto.

The Makwa River Survey, conducted by A. V. Gilbert, assisted by C. B. Gill, and the Montreal Lake Survey, conducted by G. M. Dallyn, assisted by G. A. Mulloy, are also back at Toronto.

The Lake Labiche Survey, conducted by Student Assistant R. D. Jago, assisted by O. G. Horncastle, have returned to Fredericton.

The Peace River Survey, in charge of J. A. Doucet and R. D. Macdonald, is still in the field and will remain until the close of the year in order to complete the undertaking.

W. J. Robertson, Forest Assistant at the Dominion Forestry Branch, Ottawa, has enlisted with the fourth Universities company and is in training at Montreal. D. Brophy, also of the Branch, has enlisted with the aviation corps.

L. L. Brown and W. B. Campbell, of the Forest Products Laboratories, Montreal, have been for some time with No. 2 Sanitary Section of the Expeditionary Force.

Student-Assistant, Lieut. W. E. Dexter left with the first draft of the 77th Battalion, Ottawa, for England.

G. T. Robb, who has been acting as District Inspector of Forest Reserves at Prince Albert, died recently during an operation for appendicitis.

The fire ranging season has closed and the majority of the rangers have been laid off for the winter months.

TO EVERY READER!!

The membership of the Canadian Forestry Association is constantly increasing.

The co-operation of all the present members should make possible a further gain before the close of 1915. Upon receipt of this number of the Journal will you not write out the names of two or three, or more, of your local friends who would likely be interested in our work and who might be prevailed upon to join. Copies of the Journal, with other attractive literature will be sent to each party with a personal letter explaining the objects for which the Association strives.

This is an easy way of doing your neighbor and the Association a good turn.

FROM THE RANGER'S STANDPOINT.

Incidents of the Fire Guardan's Life. The Reason for Lightning Bolts—A Poster-Eating Porcupine.

Gradually we are building up in Canada a body of men and also a body of knowledge in connection with our forest protective work. When men devote their attention to any subject, even such a difficult one as fire-fighting in forests at a distance from water, it is wonderful what an amount of information is acquired as to the best methods of work. In some of the Dominion Forestry Branch districts the rangers get together once a year to talk over their work and suggest means for making it more effective.

Ore Draws Lightning.

One of these meetings was held at Revelstoke, B.C., recently. Here a discussion took place as to the fires caused by lightning which are a serious feature of that district—the chief rangers' reports indicating that 50 per cent. of the fires come from this source.

One of the rangers advanced the theory that lightning struck in the mountains in regions underlain by iron ore, mostly iron pyrites.

As to the long continuance of fire danger one ranger told of a hollow cedar log which had smouldered all winter under the snow and broken out into flame in the spring.

Rocks Spread Fires.

One way in which fires spread in the mountains, it was stated, was by burning logs and hot rocks rolling down the steep hillside and setting fire to the forest lower down.

Good results were noted from the burning of settlers slash under the "permit" system by which no slash may be burned except upon a permit given by a fire ranger.

Hunters and Boy Scouts.

One of the rangers suggested that the provincial government which has control of the issue of hunting licenses be asked to print a warning in regard to forest fires on the back of the license tag which must be carried by every person hunting or shooting.

Another ranger suggested that forest rangers give Boy Scouts and school children practical demonstrations in proper methods of making and extinguishing camp fires. Still another suggestion was that short stories embodying the points of forest protection be read by the school teachers to the pupils on Friday afternoons.

Fire Notices Valuable.

There was quite a discussion on fire notices and on every hand the opinion was express that these notices, contrary to opinion in some quarters, had a very educative effect. It was noticeable that there were numerous requests for fire notices containing extracts from the fire laws of the province in which the ranger district is situated. Busy men in cities fancy that no one will stop long enough in front of a poster to read a part of a fire law but these rangers pointed out that these notices were posted up on prospectors' and hunters' cabins, at camping places, at lumber camps and the like where men are forced to spend much time. They have plenty of time. They are anxious to know the law and this is the only opportunity many ever have of knowing the provisions of fire acts.

Porcupines Eat Posters.

One ranger explained why the notices on his beat had to be so frequently renewed. He said the porcupines were very fond of eating the linen notices and it kept him busy replacing those destroyed.

Another incident was related which showed how widely these fire notices are distributed and how closely they are read. It may not be generally known that the Dominion Forestry Branch posts up notices in some twelve different languages and dialects, three of these being in the syllabic characters of the northern Indian tribes. The incident in question was reported by a ranger who stated that trouble had arisen in posting a Chinese notice in a lumber camp manned by Japanese.

Tree Planting on the Prairies.

These illustrations show what four years can accomplish by moderate effort and small expense. View shows the Nursery Station at Indian Head before tree planting was commenced.

As the Nursery Station looked five years afterwards—a triumph for tree planting on the plains. These remarkable results in transforming a treeless area into one of abundant and beautiful growth have been duplicated in numerous instances throughout the West.

FIRE LOSS FOR 1915---$10,000,000.

The Dominion of Canada suffered a loss of fully $10,000,000 through forest fires during 1915.

It is obvious that destruction of such dimensions cannot continue indefinitely. New growth does not equal more than a minor portion of the amount abandoned to smoke nor do the iniquitous effects of the 1915 fires do not end with an estimate of ten millions of cash. The burned areas of this year too often mean a second fire in a few months or years with the ultimate vicious consequences to the productivity of the soil and the ruin of young growth and seed trees. It is fair to say, therefore, that the estimated ten million dollars loss set down for 1915 is only the beginning of the bill chalked against the country.

That ten thousand forest fires occur every year in Canada, or over 1,400 a month between snow and snow, is an estimate based upon actual figures for the various provinces. Some of these fires are small and do little harm. Others denude large areas of magnificent growth.

Statistics regarding forest fire losses in Canada are complete only in relation to localities. So long as some of the provinces compile no estimate of their forest destruction annually, the total for the country may only be approximated. It is an unfortunate habit of some of those responsible for forest guarding to make their announcements in pleasant generalities, giving the public the idea that forest protection is amply looked after by perfected fire ranging systems, and requires no further public agitation and no radical housecleaning of official attitudes.

An Indictment of Neglect.

The plain fact is that a ten-million dollar annual loss in standing timber and young growth makes an excellent testimony to the half-thoroughness of forest protection organizations in any and every part of Canada. No one will dispute that Quebec and British Columbia have made remarkable progress in building up forest-guarding systems, appointing conscientious overseers, and striking at the evil from every angle within their reach, but the fresh strength required for further rapid progress must to a large extent come from an awakened public. No minister, however determined, can plan and spend very far ahead of Public Opinion. And one must admit, in considering the forest legislation and administration of Ontario, Quebec and British Columbia, etc., that the departments dealing with forest matters in those provinces have proceeded probably faster than public sentiment urged. In the formation and stimulation of that public sentiment on forest matters lies the chief duty of the Canadian Forestry Association.

A telegraphic despatch, dated Quebec, and appearing in many newspapers, makes the following statement:

"Throughout the Dominion last summer forest fires caused losses valued at no less than $9,536,867. The loss by forest fires is considerably lower this year than it was previously. Quebec province during the eight first months of 1915 lost through forest fires $2,254,115, which is a good deal lower than the losses in Ontario, where, although the forest areas are considerably smaller than Quebec's, the losses by fire reach the figure of $3,694,823. British Columbia, with its vast forests, only lost $913,125, due largely to its forest fire-fighting organization. The small loss by forest fires in Quebec province is attributed to the protective measures employed

by the government to prevent fight and control fires."

Ontario Suffers.

In Ontario, Quebec and New Brunswick and British Columbia 85 per cent. of the losses were due to settlers' fires. Quebec and British Columbia have secured splendid results from their "permit" laws, by which all settlers are obliged to obtain the supervision of a forest ranger before setting out their clearing fires.

Ontario has no such law, and has suffered serious consequences, but it is recognized that the Minister of Lands, Forests and Mines has the problem under consideration, and may evolve an adequate remedy in the near future. New Brunswick has already made a good start in the regulation of settlers' fires, and will presumably spread the plan across the entire province.

Perhaps the outstanding fact of the season's forest destruction is the absence of any serious loss along the lines of railway governed by the Dominion Board of Railway Commissioners and their forest protection regulations. Before the imposition of these laws, the Canadian railways were pointed out as the chief offenders in burning of forests. Now, however, the non-government lines under the Board's control are annually presenting a record of fire immunity which places them permanently among the minor causes of damage to the country's timber. As a matter of fact, only two or three fires of over ten acres in extent were attributed this year to those lines where the system of the Railway Commission has been put completely into effect. On two railways, of relatively small mileage, to which the board's regulations do not apply, no less than 200 fires were reported. Many of them were serious in extent, and at least 600,000 acres were burned over by fires due either to locomotives or men travelling along the right of way of these two roads.

Manitoba's Loss.

Manitoba lost more than $1,000,000 in damage to mature timber and young growth in 1915. The total area burned over was 800,000 acres, according to official reports thus far received. Final reports will probably show an increased loss.

The fires in Manitoba took place mainly in the latter part of May and the early part of June, and were particularly destructive in the vicinity of the Hudson Bay Railway.

In the Province of Saskatchewan the most destructive fires took place during the same period as in Manitoba, but the fires were confined more to the areas under effective patrol, and the total destruction is not so great. The present figures indicate a total burned area of about 160,000 acres, and a total damage of $170,000.

In the southern portion of Alberta there has been an exceptional amount of rain throughout the season, so that the fires reported from the region south of the Peace river country and Athabaska Landing are comparatively small in number, and covered only about 25,000 acres, on which the damage is estimated to be about $1.00 per acre.

B. C. Railway Belt.

In the valleys of the Peace river, the Lower Athabasca river and the Mackenzie river conditions have, on the other hand, been phenomenally dry, resulting in fires that have been more destructive than in many years previous. Probably not less than half a million acres were burned over. As a good deal of the country burned over is probably incapable of producing merchantable timber, the loss would not be over $200,000.

In British Columbia, the area patrolled by the Dominion rangers is confined to the railway belt. In the eastern portion of the belt rains occurred at fairly regular intervals, and while there was at several times considerable danger from fire, the ranger staff was able to cope

with the situation effectively, with the exception of the month of August in the Lower Fraser valley, where several fires got beyond control. While 10,000 acres of logged-over land were burned, the fires were kept out of the merchantable timber, only 36 acres of which were burned.

THE FOREST'S PRIME-EVIL.

By Jas. Lawler.

A man there was and he let his fire
Burn down his neighbor's shed
But he was tried and sent to jail,
And "Served him right" they said.

Oh years he spend at breaking stone,
And he sleeps on a soft plank bed
For carelessly burning his neighbor's fence
And his fifty dollar shed.

A man there was and he let his fire
Burn down a forest wide.
Millions of dollars went up in smoke—
Thousands of animals died.

Settlers rushed from burning homes,
Some were burned in their beds,
And to-day o'er the place where this was done
A deathlike desert spreads.

And the man went back to his distant home
With a buck and a hunting tale,
And none of the neighbors rose to remark
That he ought to be sent to jail.

A fool there is and his name is US
As the blindest man can see,
If its jail for the man who burns a shed
While the burner of forests goes free.

A NEW USE FOR REINDEER.

A discovery of rather unique character has been made during the past season on the waste lands planted with forest trees by the Laurentide Company at Grand Mere, Quebec. As is well known to foresters, hardwoods will grow much faster than young evergreens and unless checked in some way will seriously retard the latter's chances. Upon the areas in question, much hardwood brush and a great many hardwood stumps were causing a profuse reproduction, threatening the thousands of young evergreens which the company had set out in the same locality. In order to keep down the hardwoods, two goats were loosed and their eating operations closely watched. It was soon found that the tender young shoots of both hardwoods and evergreens were equally attractive to a goat's palate. Subsequently a herd of reindeer which had been domesticated on the company's limits with a view to eventually developing their value in place of dogs for winter travel and other purposes, were placed in the fields of young growth. They have been grazing on the plantation all summer and have not eaten a single spruce or pine but have cleaned off all the poplar, birch and maple, just as the company desired. It was all a matter of palate, the reindeer rejecting coniferous trees and devouring the tender shoots of the hardwoods. To those with similar problems on their hands the results have proved of importance.

From a letter to the Association by Alex. Bruce & Co., the Glasgow, Scotland, firm of railway sleeper and pole contractors: "We are glad to see the efforts that are being made in the interests of forestry in Canada, and we only regret that the freight of this country makes Canadian timber so very expensive by the time it reaches here as to make business very difficult.

A TALK ON FORESTRY FOR CHILDREN

By

James Lawler.

The forests of Canada mean so much to everyone in Canada that all young Canadians, girls as well as boys, ought to know about them.

In the first place let us all get rid of the idea that our present state is anything to be ashamed of. Canada is a great country in area, in population and in the industry and intelligence of its people. After all, this last is what really matters.

Foresters like trees but they only like trees because they add to the happiness and comfort of men and women. If cutting down and burning up all the trees in Canada would make the people of Canada happier, richer, more able to enjoy life and to fight for the right, then every forester would urge that a big bonfire be lighted to burn down every tree.

Trees Necessary to Life.

But foresters know that trees not only make men happier and richer but also that without trees it would be impossible to live in some parts of Canada while all parts of it would suffer.

Some time ago a poet in one of the western states wrote a poem beginning:

"Woodman, woodman, spare that tree,
Cut not a single bough."

This poem has been recited again and again and the people who recited it imagined they were doing some good to forestry.

Nothing could be further from the case, so far as commercial forestry is concerned. The farmer, who should refuse to cut down a field of wheat or corn when it was ripe, on the excuse that he wanted to conserve it, would be rightly esteemed crazy.

If a forest of trees is ripe it should be cut down and turned, as soon as possible into houses and ships and wagons and railway cars and other things which men need. To refuse to cut down a ripe forest, when there are people needing the timber, is not to save it but to lose it. The farmer's ripe wheat, if not cut, is shelled out by the wind and beaten down by the storms till it is all lost. In the same way the ripe forest trees decay, are blown down and eaten by worms without doing good to any one.

The Hope of the Forest.

The point is, that when a forest is cut down it should be cut in such a manner that the young growth is injured as little as possible. Then, if the land is not fit for farms, the young growth should be so protected (chiefly from fire) that as soon as possible it will grow up into a forest of big trees. The successful farmer, when he cuts down a field of wheat, proceeds to get the ground ready for a new and better crop of wheat. In the same way when a forest is harvested the owner of the land ought to to get the land ready for a new and better crop of trees. The farmer kills weeds that are crowding out his grain, and the forester cuts down weed trees that prevent young pines or spruces or other trees from growing.

The Man with the Axe.

The forester is the man with the axe, not the man with the spade. If we cut down our forests aright in Canada there would never be any need to plant, except to bring in new and better kinds of trees, and, badly as we have managed things in the past, we should endeavor to get on with as little planting as possible.

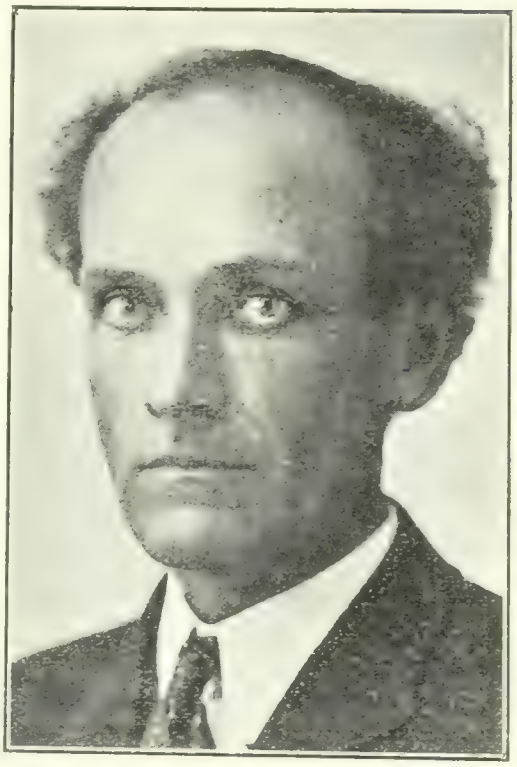
The Conquering Forest.

The trees are no decaying race that must be spoon-fed to keep them from disappearing like the dodo and the passenger pigeon. Dr. Fernow in his lecture, "The Battle of the Forest," states that the forest is a mighty army, always advancing, and that if it were not for Man and Fire the forest would in a few score years cover every part of the whole earth, except the absolute deserts and snow-capped mountain tops. Here then is a mighty force. Our forefathers in pioneer days in Canada used to consider it a relentless enemy, ever endeavoring to overrun their farms. We know it is a steadfast, unbreakable friend which, unless we drive it away with fire, will cover our sandy plains, our rocky hillsides and our steep mountains making them produce ever-repeated crops of valuable timber, keeping our streams in even flow, sheltering our insectivorous birds, protecting us against hot winds in summer and cold blasts in winter, helping the farmer, the manufacturer, the merchant, the railways, the mechanic and the laborer, and in fact every person in Canada.

Is not this a friend worth knowing and should we not all do what we can to stop the onslaughts of the enemy that does him the greatest damage—Fire?

The Use of Shade Trees.

The foregoing applies to the forest trees. They are crops which ought to be harvested for the use of man and to make way for new crops. Trees in parks, gardens and on streets are in a different class. These are not lumber trees and would not serve any very useful purpose if cut down. They are too short, have too many limbs and too many knots. But they are very useful while living. They purify the air—your teacher will tell you how—they give grateful shade, help to keep the air cooler, they rest the eyes and by



Mr. Albert Grigg, former M.P.P. for Algoma, who has taken up his duties as Deputy Minister of the Ontario Department of Lands and Forests. Mr. Grigg succeeds the late Mr. Aubrey White, C.M.G., a director of the Canadian Forestry Association for many years.

their beauty make us all happier. If the poet had written,

"Lineman, lineman spare that tree."

we would all agree with him. There are laws against the cutting down and mutilating of such trees and we should all do all we can to prevent their destruction. An ignorant, careless telephone or telegraph lineman may destroy in an hour a tree which took one hundred years to grow and which might go on growing for two hundred years more. It may be impossible because of sewers and pavements to get another tree to grow in its place, so we should fight to preserve it. But take care to see that it is a worthy tree, not a short-lived, dirty tree unsuited to streets and parks before we make our protests.

A tree is no good in itself but only in so far as it does good to men, women and children.

NEW OFFICES FOR ASSOCIATION.

Meeting of Directors Authorized Improved Equipment to Carry on the Work.—Annual Meeting, January 20th.

New offices for the Canadian Forestry Association were advocated and authorized at a meeting of the Board of Directors held in the office of the Director of Forestry, Mr. R. H. Campbell, on October 28th.

The Association is now located in excellent quarters on the fourth floor of the new Booth Building, Sparks Street, Ottawa. An assistant has been engaged and with these new and better facilities, the work of the Association will increase in volume and in scope.

Hitherto, the Association occupied desk room in one of the departments of the Forestry Branch and while this courtesy of the Director of Forestry greatly aided the Association in numerous ways, it was felt by many that the growth of the work and the healthy condition of the funds justified a forward move.

There were present at the meeting: Mr. Denis Murphy, who acted as chairman in the absence of the president; Mr. Hiram Robinson, Mr. C. Jackson Booth, Hon. Sydney Fisher, Mr. A. S. Goodeve, and Mr. R. H. Campbell. Letters and telegrams were received from the President, Mr. F. C. Whitman, Mr. G. Y. Chown, Mr. Gordon C. Edwards, Mr. E. Stewart, Dr. B. E. Fernow, Mr. C. E. E. Ussher, Mr. W. C. J. Hall, and Mr. Ellwood Wilson.

It was decided to hold the Annual Meeting on January 20th. The reasons for selecting this date appealed favorably to the directors. Four organizations of more or less related aims, The Canadian Forestry Association, Commission of Conservation, Canadian Lumbermen's Association, and Canadian Society of Forest Engineers, hold their annual meetings early in the year. The Conservation Commission is obliged by statute to meet on January 18th and 19th next. With that fact in view, the other three societies have arranged to group their meetings within the three day period—January 18-20, Tuesday, Wednesday and Thursday—so as to increase the attendance at all the meetings and arouse an interest otherwise impossible.

It is definitely settled, therefore, that the Canadian Forestry Association will meet on Thursday, January 20th, and in all probability the Canadian Lumbermen's Association will hold its sessions the day previous.

The meeting will not be restricted to business considerations but a number of addresses will be given at both morning and afternoon sessions. Negotiations are being carried on for the appearance of several speakers of more than national prominence, so that the 20th of January will be a day of interest for every member and friend of the Association who can come to Ottawa.

A joint banquet will be held at the Chateau Laurier probably on the night of Wednesday, the 19th. The Secretary of the Canadian Forestry Association would be obliged for advance intimations from all who intend to be present at any of the meetings or the banquet.

The Canadian Forestry Journal will be sent to any address for one dollar a year.

TIMBER IN CANADA.

By

R. H. Campbell,

Director of Forestry.

Canada's present supply of commercial timber has been variously estimated at lying between five and seven hundred billion feet, board measure, and covering an area of approximately 170,000,000 acres. This estimate refers only to timber of commercial value as saw timber. It does not include pulpwood, firewood, tie and pole material or small timber of any description, although this may have considerable commercial value.

Even pulpwood values are difficult to estimate as so much depends on accessibility to market. Firewood may be worth four dollars a cord in the settled parts of the country, and may have absolutely no value whatever in more remote districts. Ties may be worth forty cents at the railway, but the cost of transporting them may exceed this value, and they then become valueless for the present at least.

A complete estimate of available forest products could not even be attempted with the information existing, and this estimate is therefore largely confined to commercial saw timber (including all material ten inches and over in diameter at the stump).

British Columbia contains a land area of approximately 226,186,240 acres (353,416 square miles), of which about twenty-one per cent. is covered with commercial saw timber. This area of about 50 million acres has been estimated to contain 300 billion feet board measure.

From a paper presented at a meeting of the International Engineering Congress, 1915, in San Francisco, Ca., September 20-25, 1915.

Coast Types of Timber.

The coast type is made up largely of Douglas fir, hemlock, Sitka spruce, western red cedar, western tamarack, western white pine and others of less commercial importance, and contains the bulk of British Columbia's best saw timber (about 225 million feet). The interior is divided into two distinct types. The Dry Belt country is characterized by light precipitation and the tree growth is light in consequence. It consists largely of Douglas fir and western yellow pine. The Kootenay country has a high annual precipitation and is practically a modified repetition of the coast type, characterized by the addition of such species as mountain fir and Engelmann spruce, and a lack of Sitka spruce. This type grades into the Southern Rocky Mountain type of mountain fir, Englemann spruce and lodgepole pine, which crosses the summit and clothes the eastern slope of the Rockies down to the prairie line.

British Columbia cut in 1913: 1,173,647,000 feet, board measure, of lumber in her mills. Over two-thirds of this was Douglas fir, about 7% was tamarack and 7% red cedar, and of the remainder, 5% was spruce, 5% western yellow pine, 3% hemlock, 2% western white pine, and 1% each, mountain fir and jack pine. With the exception of unimportant qualities of cottonwood, maple and birch, no hardwoods are found in this province. Twelve kinds of wood were reported.

The province of Alberta has a total land area of 161,000,000 acres (252,925 square miles), of which 5,416,000 acres are said to contain

saw timber to the extent of twenty-one billion board feet. Four reserves exist in Alberta at the present time, and these contain 16,711,776 acres. This province sawed in 1913, 44,662,000 feet of lumber of the following composition: Spruce, 93.8%; jack pine, 5%, and small quantities of Douglas fir, tamarack, poplar, balsam fir and birch. With the exception of birch and poplar the forests of Alberta are entirely coniferous. The Douglas fir, Engelmann spruce, mountain fir and lodgepole pine, extend from British Columbia down the eastern slope and mix with the typically northern forest type.

Northwest Territories.

In the northwest territories and the Yukon the forest at the present time has practically no commercial value. Forest cover exists but the trees are not found in commercial sizes or quantities. Wood is used locally for fuel, fencing and rough construction, but none is sawn and brought to the lumber market. The country is sparsely settled; much of it has never been explored.

Saskatchewan's land area is 155,764,080 acres (243,382 square miles) and the province's timber area covers 3,584,000 acres and contains about fourteen bilion board feet. The province in 1913 cut 114,800,000 board feet of lumber. The lumber was made up of spruce (98.2%) almost entirely, with small unimportant quantities of tamarack, jack pine and poplar. The forest reserves in Saskatchewan cover an area of 1,152,889 acres and consist of eight different reserves.

Manitoba contains a land area of 148,432,640 acres (231,926 square miles), of which 1,920,000 acres are saw timber land with a stand of some 6,850,000,000 feet of timber. The northern part of this province is covered with the same northern forest type found in Saskatchewan and eastern Alberta, but another type is found in the south-eastern part, sometimes called the southern Laurentian type. It is characterized by white and red pine, cedar and hemlock among the conifers and such eastern hardwoods as maple, yellow birch, elm, ash, basswood, beech, etc. The white and red pine reach Manitoba as do also the cedar, black ash, white elm, and basswood; the other trees of this type are usually confined to Ontario and the provinces farther east.

Manitoba in 1913 cut a total of 71,961,000 feet of lumber in her saw mills. Spruce formed about 90% of this quantity as in the other prairie provinces. Smaller quantities of poplar, tamarack, jack pine, birch and balsam fir are also produced. Five forest reserves have been set aside, containing an area of 2,629,440 acres.

Ontario Leads Production.

Ontario is Canada's largest lumber producing province and probably contains more mature standing timber than any other province excepting, perhaps, British Columbia. The land area of Ontario has been estimated at 234,163,200 acres (365,880 square miles). The greater part of this area is covered with the northern forest type of spruce, jack pine, polar, balsam fir and tamarack, and parts of the northwestern portion of the province are treeless or covered with timber of no commercial value. This northern type in Ontario covers at least 180 million acres. South of this in Ontario and, generally speaking, south of the height of land between the St. Lawrence and Hudson Bay basins, we find the southern Laurentian type of forest which covers the southern rim of the Laurentian shield of rock formation. This type covers some hundred million acres in Ontario and Quebec, and has been estimated to contain 200 billion feet of saw timber. In this area are situated the principal forest reserves of both these provinces. Ontario has a forest reserve area of 11,539,200 acres (18,030 square miles) and Quebec has 111,-

400,320 acres (174,062 square miles). Ontario is Canada's premier white pine province and the stand of this species has been estimated at about 40 billion feet. The productive forest area in Ontario probably consists of from 70 to 90 million acres.

South of the southern Laurentian type we find the northern fringe of the great central hardwood type of the United States. This type of forest covers the middle west and eastern states of the Union and extends across the boundary to Southern Quebec and Ontario.

Ontario in 1913 cut 1,101,066,000 board feet of lumber, of which white pine formed about half of the total. the cut was made up as follows: White pine, 46.9%; hemlock, 13%; red pine, 12.0%; spruce, 9.5%; maple (the most important hardwood), 5.6%, and twenty-two other kinds of wood, making a total of twenty-seven kinds.

Quebec, with its recently added territory, now contains a land area of 442,153,600 acres (690,865 square miles). Of this, about 367 million acres belong to the Northern Forest type of pure conifers, 50 million to conifers with mixed hardwoods and about 5 million acres to the hardwood type. The eastern counties of Quebec, south of the St. Lawrence, belong to another type which is characteristic of the Maritime provinces, and is similar to the southern Laurentian. This type in Quebec covers about twenty million acres.

The Quebec government has reserved 111,400,320 acres (114,063 square miles) of forest land. The greater part of this lies in the northern portion of the province, either in southern Laurentian or Northern Forest type and most of it is not heavily timbered.

The Cut in Quebec.

Quebec in 1913 cut 630,346,000 feet of lumber. Spruce here forms 65.4% of the total, white pine only 11.4% and hemlock 6.1%; birch comes forth on the list with 5.4%, and is the most important hardwood. Generally speaking, the rest of the lumber output is similar in composition to that of Ontario.

The provinces of New Brunswick and Nova Scotia and the eastern counties of Quebec, or in short that part of Canada lying south of the St. Lawrence River, is covered by a forest type often called the Acadian. This consists chiefly of birch, maple and beech, with smaller quantities of basswood, ash, elm, oak and butternut. Red spruce is the most important conifer as compared to white pine in the southern Laurentian, and white spruce in the northern forest type. White and red pine are found in the Acadian type often in great abundance, but pure stands are scarce and most of the best material has been removed. The forest area make up a total of 14 million acres, and is supposed to contain in round figures 100 billion feet of lumber. There are no forest reserves in the Maritime Provinces.

New Brunswick has a land area of 17,863,040 acres (27,911 square miles). The forest area has been estimated at 12 million acres, but this, of course, includes more than commercial saw timber land. The standing timber has been estimated at 22 billion feet of the following composition: Spruce, 60%; pine, 10%, hemlock, 5%; cedar, 5%, and hardwoods, 20%. With the spruce in this estimate would be included balsam fir which is often sold mixed with spruce. New Brunswick in 1913 cut 399,247,000 feet of lumber of the following kinds: Spruce, 79.3%; white pine, 7.8%; hemlock, 5.5%; balsam fir, 4.3%, and birch (the most important hardwood), 1.4%.

Nova Scotia's Timber.

Nova Scotia's land area is 13,483,520 acres (21,068 square miles). The forest area has been estimated at 5,744,000 acres, and the coniferous saw timber at ten billion feet board measure. The hardwoods might provide five billion feet. The stand-

ing timber (conifers) would have the following composition: Red spruce, five billion feet; hemlock, three billion; white pine, one billion, and the remainder, balsam fir, tamarack, red and jack pine, and white and black spruce. The hardwooks would be: Beech, 40%; sugar maple, 30%; yellor birch, 20%, and white and wire birch, soft maple, red oak, white ash and black ash, the remaining 10%. Nova Scotia cut about 274,722,000 board feet of lumber in 1913. Spruce formed 56.9% and hemlock 23.2% of this total. Seventeen kinds of wood in all have been reported from this province.

The forest area of Prince Edward Island is too small to be considered in a general estimate of this sort as the entire area of the province is only 1,397,760 acres (2,184 square miles). The annual production is 6,771,000 board feet, of which spruce forms a half and balsam fir a quarter. Fifteen kinds of wood in all were reported in 1912.

"YOUR HELP IS WANTED HERE!"

Under the above title the Canadian Forestry Association issued during the past month 15,000 eight-page booklets for the express use of settlers, river-drivers, section-men, and others who are brought into contact with standing timber. The front page, done in four colors, represented a forested hillside blazing fiercely, the flames leaping into the sky, while in the foreground lay the charred wreckage of broken trunks and branches.

This was the first of a series of illustrated booklets which will be prepared and distributed by the Association during the winter and spring months, but particularly the latter. A first edition of 10,000 in English and 5,000 in French was secured, but the immediate demand from all parts of Canada makes it desirable to quadruple that number. The chief value of this first attempt at an attractive propagandist booklet for wholesale distribution in most of the forested districts of Canada lay in the hearty response from the Head offices of Canadian banks, the railway companies, and officers of forest organizations who generously offered every facility to the Association for getting literature into the hands of settlers and others.

For the information of members who are interested in this form of publicity, the cost of printing 5,000 pamphlets like "Your Help Is Wanted Here" is fifty dollars. Simpler forms of literature can be prepared and printed for a great deal less. It will thus be seen that any member who cares to subscribe $100 to the Association, for publicity uses solely, will make possible the publication and distribution of from 10,000 to 30,000 attractive booklets. The costly end of the work is gladly borne by the Association and the various agencies who have offered to take care of the distribution.

Large Editions Demanded.

Within a week of the issue of the last booklet the chief officials of three Canadian railway companies had requested 4,000 copies for immediate distribution to their employes from coast to coast. The Head Offices of Canadian Banks presented the names of fully five-hundred branches to which they wished packets of the pamphlets sent, and, in addition, they pledged the co-operation of their branch managers in making distribution effective.

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Send the Secretary the name of a friend who might be interested. Even better, ASK the friend to let his name be entered as a member. The fee is one dollar a year and brings the Canadian Forestry Journal and other publications.

Not a few members have sent in a friend's name and have paid the membership fee on his behalf.

No reason exists why the Canadian Forestry Association should not grow substantially between the receipt of this issue of the Journal and the close of 1915.

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Secretary, Canadian Forestry Association,
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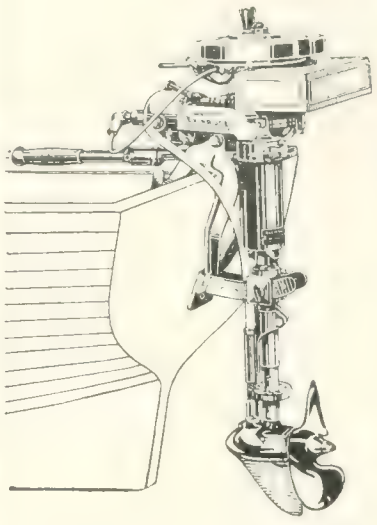

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NEW STORAGE DAM TO PROTECT ST. MAURICE FLOW.

Work has commenced on the large new storage dam being built by the Quebec Government to control the flow of the St. Maurice River. This dam is forty-four miles from the nearest railroad, the National Transcontinental, and barges and steamers are being provided to carry supplies, cement, etc., to the first rapid, a distance of twenty-eight miles and from that point to the dam site, sixteen miles, a railroad will be built. This dam will be the largest water conservation scheme in the world and will hold back twice the amount of water stored by the enlarged Assouan dam on the Nile. It will be about 2,000 feet long and eighty feet high at the highest point. There are many large lakes above this dam, one being over thirty miles in length, and the level of all of these lakes will be raised. The timber which will be destroyed is for the most part scrub-by black spruce, balsam, birch and poplar and little of it has any commercial value. There are no settlements of any kind, only one Hudson Bay Post on Lake Obiduan, the country being inhabited by Indians.

Tenders are also being asked for a dam to be constructed at the outlet of Lake St. Francis, on the St. Francis River, on the south shore of the St. Lawrence, which serves a number of important industries which have been much hampered by low water in the summer time.

MORE FINES FOR SETTLERS.

Continuing their vigorous prosecutions of Quebec settlers for starting dangerous fires in their clearings without a Government permit, the prosecutors acting for the provincial authorities succeeded in convicting six more settlers before Judge Goyette at Nominigue on November 4th. By making three months imprisonment the option to non-payment of heavy fines Quebec is rapidly impressing the fact on the public mind

that destruction of provincial timber by carelessness is a crime to be punished as severely as any other form of arson.

Following were the results at Nominigue: J. Matine, Lac des Iles, fined $10 and costs or three months' imprisonment; A. Charette, L'Annonciation, fined $7.70 and costs or three months' imprisonment; Jos. Guindon, Mont Laurier, fined $10 and costs or three months' imprisonment; A. Binette, Notre Dame du Laus, fined $2.00 and costs; A. Binette, Notre Dame du Laus, fined $2.00 and costs; A. Bergeron, Notre Dame du Laus, fined $2.00 and costs.

Evidence was supplied by the officers of the Lower Ottawa Forest Protective Association.

FIRST TOWN FOREST.

Fitchburg, Mass., claims to be the first municipality in the country to have officially set aside under a State law an area which is not connected in any way with its parks or water supply system for the express purpose of growing trees for profit. The action of the city government was taken in accordance with the Town Forest Law by which cities and towns within the Commonwealth may own, control and operate forests. For this purpose, four tracts aggregating 105 acres in extent have been set apart to be known and used as a Town Forest. These tracts contain 50, 31, 16 and 8 acres, respectively. About one-fourth of this land is now covered with white pine ranging in age from 20 to 60 years. The remainder is cut-over land, now partly covered with sprout growth so common in Massachusetts.

The city forester, Mr. Page S. Bunker, will prepare working plans for this area and the planting of the cut-over land to white pine will begin next spring. Mr. Bunker was connected for many years with the United States Forest Service and is ably fitted to develop an efficient forest for the city. He has been in his present position but a few months.

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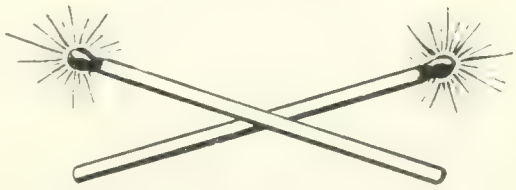

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THE TREE MURDERERS.

(Editorial, Ottawa Free Press.)

The attention of The Free Press was called the other day to the action of the civic authorities in consenting to the cutting down of a number of trees on the bank of the river at the end of Daly avenue. Having always taken a keen pride in the hundreds of old trees in the streets and parks of the city, and being interested in their preservation as are thousands of other citizens, enquiry was made at the city hall about the matter. There it was learned that the civic authorities had given permission to a private citizen to have the trees removed because "they obstructed his view."

In explanation of his part in the matter, the official to whom The Free Press spoke stated that "the only purpose served by the trees" was in affording safeguard against vehicles running over the river bank. As the citizen whose view was obstructed offered to put up a fence to serve this purpose, authority was given him to cut down the trees.

Having seen contractors in various parts of the city ruthlessly hack down fine old trees rather than set a projected building back a few feet, the explanation did not come altogether as a surprise. Tree vandalism seems to be in the blood of a large number of our people. Walking on a country road not far from Ottawa the other day, we noticed that for a distance of over a mile every elm tree fifty yards apart in a row at one side had been mutilated and completely spoiled to permit of the stringing of a power line. There seemed no reason why the poles carrying that electric wire should not have been carried out three or four feet. The tree butchers simply could not spare the axe, and the picturesque growth of half a century was destroyed in a few minutes.

What an abomination this reducing everything to a basis of utilitarianism is. For instance, the Ottawa civic authorities maintaining that this city can afford to cut down its beautiful trees and build hideous fences in their place.

In this connection, too, we fear there is a lack of proper supervision in the work of tree trimming. Twice a year one sees men cutting and slashing at the great trees along our principal streets. It is only a few weeks since we noticed such operations on Metcalfe street. Protest was made by one of the tree trimmers to the foreman against the removal of a great limb. "Oh, cut it off," was the careless command of the foreman, who, whatever his executive ability may have been, did not bear the appearance of a man qualified to judge of the value of trees. As a matter of fact, the "job of tree inspector" is frequently made the subject of jokes at the board of control meetings.

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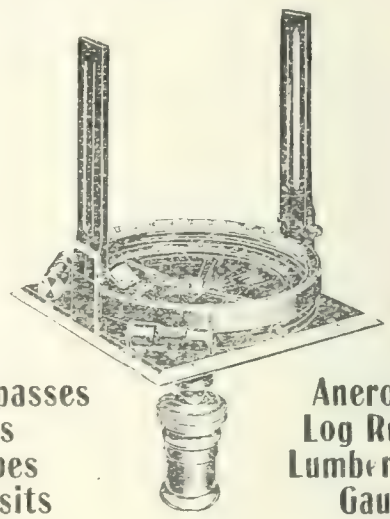
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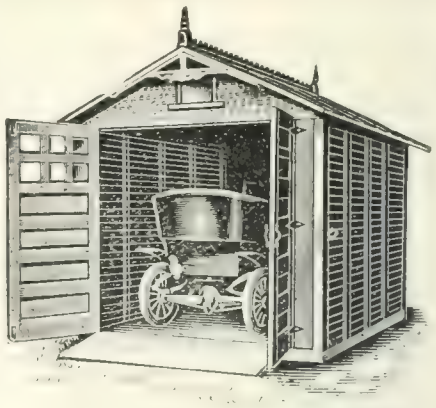

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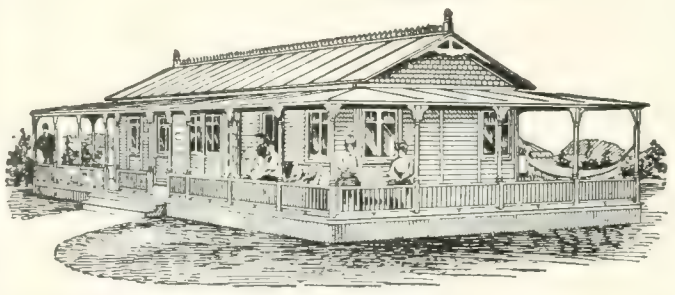

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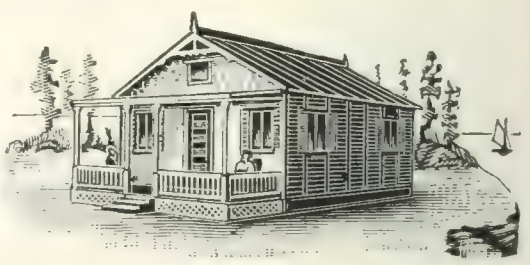


New President of Laurentide A Champion of Forestry.

Mr. George Chahoon, Jr., a Director of the Canadian Forestry Association and Associate Member of the Canadian Society of Forest Engineers, has been elected President of the Laurentide Co., Ltd., the largest paper company in Canada, to succeed the late Sir William Van Horne. Mr. Chahoon, like Sir William, was born in the United States, being a native of Au Sable Forks, in the Adirondacks, where his family has long had paper interests. He is still a young man, being only forty-three. He took charge of the Laurentide Company about twelve years ago and has built it up to its present high standing. His broad general interests and open mindedness early persuaded him that only happy and contented employes give their best work and he has done everything to make Grand Mere, not only livable but also attractive and has succeeded in building up one of the prettiest villages in Canada. Realizing that a cheap and steady supply of raw material was of vital necessity to this Company he became interested in forestry and has done more along practical lines to utilize what this science had to offer than almost any man in Canada, taking not only a selfish interest in it but looking at it from the broadest standpoint and urging the Provincial Government to a more progressive policy. The first large forest survey in Quebec was that made by his Company and it is also the first one to take up commercial planting on a large scale.

ADD ONE---

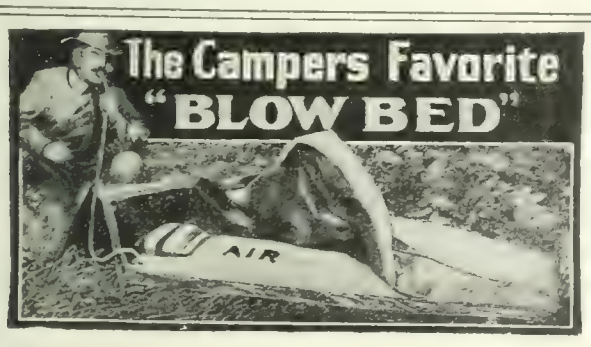
Have you filled in the blanks on page 269?

A moment's attention to this means much to the progress of the Canadian Forestry Association.

If the prospective member is within hail, ask him to sign and subscribe his annual fee of a dollar.

If he is not within hail, sign for him and either remit the fee or notify the Secretary that it will be paid later.

Better turn back to 269 now.



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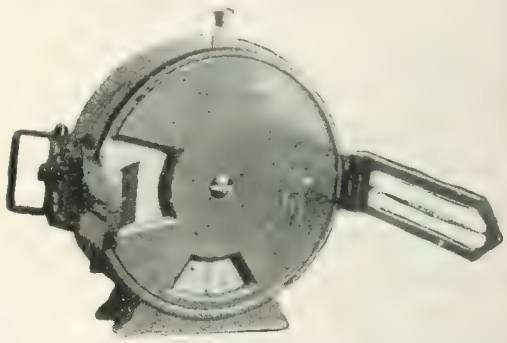

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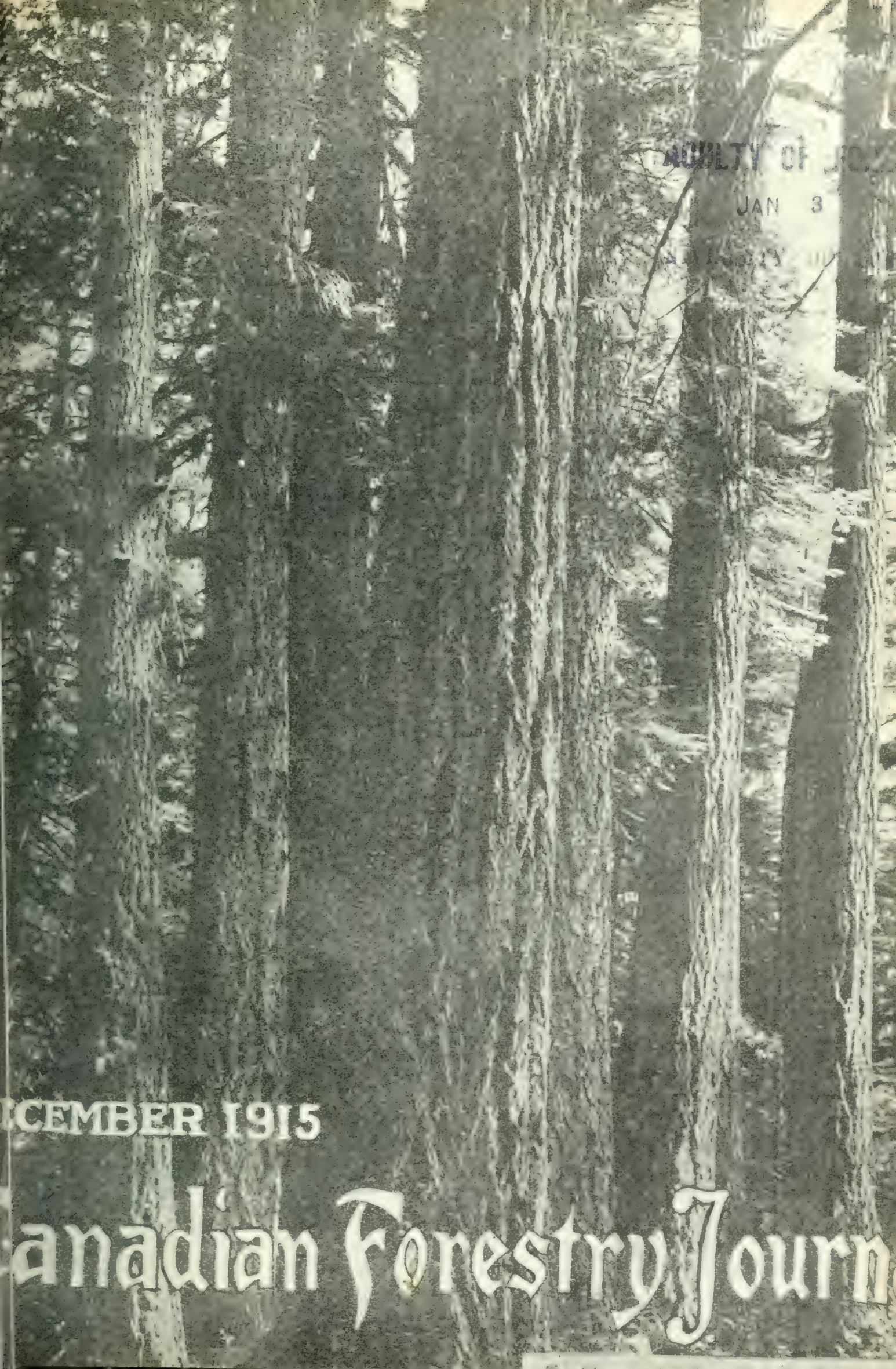

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CANADIAN FORESTRY JOURNAL.

Published monthly by the

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Canadian Forestry Journal

VOL. XI. DECEMBER, 1915. NO. 12.
(Printed at Kingston, Ont.)

Shade

Theodosia Garrison.

The kindliest thing God ever made,
His hand of very healing laid
Upon a fevered world, is shade.

His glorious company of trees
Throw out their mantles, and on these
The dust-stained wanderer finds ease.

Green temples, closed against the beat
Of noontime's blinding glare and heat,
Open to any pilgrim's feet.

The white road blisters in the sun;
Now half the weary journey done,
Enter and rest, O weary one!

And feel the dew of dawn still wet
Beneath thy feet, and so forget
The burning highway's ache and fret.

This is God's hospitality,
And whoso rests beneath a tree
Hath cause to thank Him gratefully.

The Relation of Forestry To Irrigation

Western Canada's Irrigation Requirements are Linked Inseparably to Preservation of the Western Forests.

By R. D. Prettie,

Superintendent of Forestry, Department of Natural Resources, C. P. R., Calgary, Alta.; Director, Canadian Forestry Association.

Water is the common property of all and on it depends the ultimate basis of all land values. Its equitable administration is a primary necessity in furthering the welfare of the community. By its influence vast desert wastes have been reclaimed to enrich the world, and populous agricultural communities established and given the opportunity to become prosperous and independent—the reward for intelligent labor. The student of economics recognizes nothing more clearly than the close relationship existing between the country's various industries and its dependence upon a normal development of the natural resources. This is very apparent in regard to the inter-dependence of irrigation and forestry as auxiliaries to industrial progress in sections of the country where irrigation is of primary importance in agricultural development.

The irrigation policy in Western Canada and its relation to the forest is inseparable: it is to bring under cultivation and increase the production on lands which receive insufficient rainfall for the profitable production of crops. The dependence of western agriculture upon irrigation is of great importance and demands that we must conserve the forests that store the water.

This is the gaunt product of a mountain-side fire in British Columbia. Every fire on the watersheds destroys a natural reservoir for water. And without water, large sections of Western Canada must remain forever a barrens.

The effect of forest agencies on rainfall, regulation of moisture, and preserving humidity has been re-

Picture shows a C. P. R. Irrigation block. Note the splendid showing of wheat in the field to the right. The farmer who owns that crop ought to be a friend to forest preservation for without the standing forests on the eastern slopes of the Rockies the irrigation projects would represent wasted capital and labor.

corded from ancient times to the present.

The shade afforded by the crowns of trees provide a more or less dense roof at a certain distance from the ground, thus intercepting the rays of the sun and the falling rain; obstructing the movement of air currents and reducing the radiation of heat during the night.

In all forests there is more or less vegetable matter made up of leaves, old wood, mosses and decaying herbaceous plants, all of which form a layer of organic matter or humus which covers the earth and fills in the places between rocks. In whatever position it rests, it absorbs and retains a large amount of rainfall or moisture produced from the mountain snow, until it slowly sinks into the ground below, or is taken up by evaporation.

A portion of the water which thus enters the soil is taken up by the trees and exhaled by their leaves, thereby adding humidity to the surrounding atmosphere; another portion descends beyond the reach of the roots, and finding subterranean channels is carried onward until it again comes to the surface in springs, or sinks to lower depths and entirely disappears.

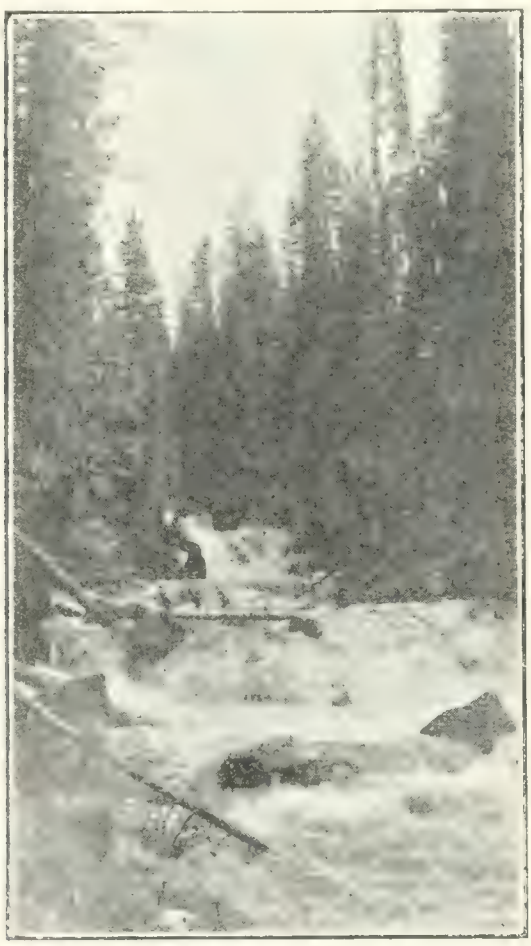
Natural Reservoirs.

That the vast deposits of vegatable matter in our great forests are the reservoirs from which innnumerable springs and brooks are supplied is unquestionable. In all regions where there is considerable snow in winter it remains much longer in the woods where it is shaded than upon the bare hills and mountains; hence the more continuous flow of brooks that have their source in elevated forest covered regions. If the trees are removed from the hills, mountains, and elevated regions of a country, the great masses of vegetable mould which absorbs, retains, and checks the rapid descent of water from the higher to the lower levels disappear, and instead of water falling upon a sponge-like bed, it strikes the bare

earth or rocks from which it slides, rushing onward with constantly increasing velocity—forcing brooks and rivers to overflow their banks, often causing great destruction of life and property. The rapid movement of water from higher to lower levels removes all the lighter and more fertile parts of the soil, and this is repeated until the mountains and hillsides have lost the last remnant of a fertile soil, and become totally barren. Such lands can never be of any great value for cultivation, and for this reason, if no other, they ought to be reserved and kept covered with forests, as part of the public domain.

Effects of Bad Logging.

Slashing the forests from the mountain slope results in: (1) Increasing and excessive floods; (2) Lengthening of low water periods; (3) Deposition of large quantities of mountain debris, covering the lower fertile lands.



A British Columbia forest waterfall showing the density of tree growth.

Logging operations which have been up to the present unfortunately followed by fire, destroy the absorptive layer of the soil, leaving nothing to absorb or retain moisture. Exploitation accomplished by the modern methods of conservative lumbering, under government supervision, will aim to overcome and eliminate dangers to the dependent agricultural interests.

Observations made by German Forest Officials show that of 100 m.m (4 in.) of water falling on forested territory, 10.5% evaporates; 20% is arrested by the crowns of the trees; 25% is absorbed by the forest floor; and 44.5% soaks into the upper layers of the soil.

On the other hand, when the same quantity of rain falls on open ground, 68.5% evaporates and 31.5% is held in the soil.

The Director of the Yale Forest School gives an example of the careful comparison of the stream flow of a forested area and a non-forested area in the San Bernardino Mountains.

The forested area (under scientific forest management) which during December had a run-off of 5% of the heavy precipitation of that month; and during January, February and March of the following year had a run-off of 37% of the total precipitation, experienced a well sustained stream flow of three months after the close of the rainy season.

The non-forested catchment area, which during December had a run-off of 40% of the precipitation, and which during the three following months had a run-off of 90 per cent. of the precipitation, experienced a run-off in April (per square mile) of less than one-third of the forested catchment area, and in June the flow of the non-forested area had ceased altogether.

On the Trent Watershed.

In 1911, the Commission of Conservation had a survey made of the Trent Watershed which covers an

area of 1,662,900 acres. This report shows that the original forest cover on the lower watersheds had an area of over 1,000,000 acres. This was made up of 75% white pine and the other 25% of pure hardwood. Wasteful lumbering, followed by repeated fires, has resulted in the destruction of 75% of the pine and hardwoods, together with completely destroying the forest cover on 10% of the original area. Unless stringent cutting regulations are enforced the further destruction of forest cover on the headwaters of these watersheds, it will be impossible to hold the water in check, and floods such as have been experienced in the Mississippi Valley will be the result.

The Province of British Columbia has entered upon a most thoroughgoing scheme of forest management and control with a competent board of directors and experts in every department. The board has secured the co-operation and sympathy of the people of the province, and the ultimate success of their up-to-date progressive policy is assurred. With only 10% of the irrigable fruit lands of the province under management, it is well for the province to see that the necessary steps are taken to perpetuate and control the water supply so necessary for its welfare and prosperity.

That the practice of sane forestry in our great watershed regions will safeguard the water interests of irrigation, and at the same time produce the maximum economic revenue in wood products, is proven beyond doubt.

In order to conserve the water resources so as to insure a normal development of our industries and provide for their future growth, it is essential to secure the immediate enactment and active enforcement of such legislation as will protect these resources from the ravages of fire and other destructive agencies; to acquire such lands as are necessary for the adequate protection of the forest cover of catchment areas, and put into operation such other beneficial factors as will assist in the preservation and maintenance of the water supply.

"The Boy Scout's Forest-Book"

Under this title, the Canadian Forestry Association will issue shortly 15,000 copies of a 20-page booklet designed especially for the use of Boy Scouts. Through the kind co-operation of the Honorary Secretary of the Boy Scout Movement, Mr. Gerald H. Brown, of Ottawa, a very careful distribution will be made by sending packets of the books to the various local masters with instructions to place one in the hands of each Scout.

The booklet should be an attractive publication as it will contain ten pages of half-tone illustrations and about ten pages of reading matter. The army of Boy Scouts of 1915 will be the bosses of the country a few years hence. It is highly important that the attractive truths of forest conservation should reach them at their present stage.

As an added incentive to study the "Forest Book" carefully, the Association will offer substantial cash prizes for essays to be written upon a set of questions. Full details of the essay competition and prizes will appear in each copy of the booklet.

Italians planting trees with mattocks. Burnt over lands grown up in aspen and white birch.

Planting Forests For Profit

The Interesting Story of the Laurentide Company's Success on Waste Lands Near Grand Mere, P.Q.

By Ellwood Wilson,

Chief Forester, The Laurentide Company, Limited.

While no excuse is necessary for beginning to plant trees on a large scale for a future supply of raw material, still the reasons which led to the inception of the idea by the Laurentide Company, Ltd., of Grand Mere, Quebec, may be of interest to the members of the Canadian Forestry Association.

Lumbering on this continent had always seemed to me to be conducted in a very hand-to-mouth way. The waste, the rule of thumb methods, the way-father-used-to-do-it attitude of mind, the recklessness in regard to fires and the lack of thought for the future seemed so inefficient. Lumbering was carried on precisely like mining and when the forest was exploited and des-

troyed in one section the lumberman moved on to another. Then a trip to Europe, just after leaving the university, on which I tramped and bicycled through northern France, southern Germany and part of Austria and Switzerland, opened my eyes to the possibilities of rational utilization of forests. It is of course self-evident to every thinking person that no scheme of operations can be bodily transferred from one set of conditions to another entirely dissimilar, but the general underlying principles are the same and can be adapted to different circumstances. This point of view was strengthened by a study of lumbering conditions in the Adirondacks and my first trip into the woods in Quebec showed me that Canada was still playing with zest the good old game of killing the goose that lays the golden eggs.

The Case of Paper Mills.

If the above is true for the lumberman, how very much truer it is for the pulp and paper industry, anchored to a locality by a costly plant, designed to run practically forever. The two essentials for the manufacture of pulp and paper, cheap wood and abundant water, are inseparably bound together and mutually inter-dependent, for as the forests are cut off the supply of water diminishes and becomes uncertain.

When one of these plants is to be built, an expert engineer is consulted, elaborate plans are made, expensive surveys of rivers and careful guaging of their flow are carried out and every effort is made to see that in the handling of materials from one part of the plant to another there shall be no waste and no lost motion. Every device which will reduce the cost of conversion and eliminate waste or do away with labor is installed, all sorts of precautions against fire are taken and the most efficient and economical methods are planned. But the forest, on which the success of the whole enterprise completely depends is treated in the most casual way. Some man who is supposed to know the country is sent out to report on the timber. He is popularly supposed to have some instinct by which he can in a few days say how much timber there is standing on a thousand square miles, and all honor to the cruiser for the way he tries. Millions have been spent for plants by directors who had absolutely no idea of their timberlands, no maps, no estimate of the amount of timber, worthy of the name, and no idea of how long the available supply would last. Often part of the lands were so inaccessible that it will practically never pay to remove the timber.

The Idea in Practice.

It has always seemed to me uneconomical to hold a million acres of timber, one hundred miles from where it can be used, with the crudest means of transportation only available, when the same supply could, in a relatively short space of time, be provided for by planting one hundred thousand acres situated ten miles from the point of utilization. With such a supply more economical methods of cutting, handling and transport can be used and machinery substituted for hand labor. Then, too, the fire risk is materially reduced and closer ultization owing to cheaper transport eliminates a very large amount of waste.

This point of view I laid before the Vice-President of the Laurentide Company about 1907 and secured his consent to the making of some experiments. Having thirty fire-rangers waiting to go into the woods in May, 1908, I obtained through the kindness of Mr. E. J. Zavitz, Forester for Ontario, five thousand, white, Scotch and Jack Pine trees, four years old and these were planted on waste lands on the banks of the St. Maurice River. They have grown well and have reached an average height, for the white pine of five

feet, for the Scotch pine of eight to ten feet and for the jack pine of twelve to fourteen feet.

An Improved Nursery.

In the winter of 1910-11 a trip to the more important forest and nursery stations in Norway, Sweden, Germany, France, Austria and Switzerland confirmed me in my views and in the spring of 1911 a very small nursery was started which has since been enlarged each year and will next year have a capacity of 1,000,000 trees per year. In the beginning we modelled our work on the New York State Nursery at Lake Clear Junction under Mr. Pettis, New York State Forester, but our experiments have led us to depart quite widely from that practice so as to meet local climatic conditions. We do not surround our beds with planks, they are hardly raised at all above the level of the surrounding ground, we use no wire screens or burlap over the beds and we do not plant broadcast. Mr. Arnold Hannsen, who is in charge of this work, has discovered that most of the conifers do better if planted in the fall; they germinate early in the spring and show a larger germination per cent. and seem to be less sensitive to damping off, this is most marked with white pine which gains practically a year's growth by being sowed in the fall. We find the Norway Spruce a much easier tree to raise from seed than any other spruce that we have tried. It germinates better, the growth is more rapid and the trees hardy. White spruce germinates poorly and for the first two years grows very slowly. Balsam shows the same results. All the native pines are easy to raise and show good results and

Scotch pine planted in 1908 on steep clay bank with south-west exposure. Ontario grown stock.

Pinus Ponderosa also does well here, so far. Abies Nobilis does better in the nursery than the local variety. Our average cost for trees ready to plant out in their permanent location is $1.80 per thousand.

Favor Norway Spruce.

In 1912 we planted 10,000 trees out, in 1913 about the same number, in 1914, 145,350 and in 1915, 211,510. Practically all of the trees planted out have been Norway Spruce which seem to thrive well. Our only failure has been with red pine planted in the fall, a small plantation on poor sandy land, which was planted during a dry spell and in which about 50 per cent. of the trees died. In general we have lost less than one per cent. Spruce seems to do equally well whether planted in the spring or in the fall.

Plantations have been made under all sorts of conditions and on all sorts of soil and we are securing a large amount of information and much valuable experience. Underplanting has been done on several tracts and so far shows excellent results. Spruce grows slowly for the first two years, 4 to 6 inches and then commences to grow at the rate of a foot and over each year. All of our recent planting has been done with the Jensen tree planter which makes it a good deal cheaper and the loss is less. We can plant trees with this machine from two year old seedlings up to large four year old transplants, we generally use three year old seedlings. The larger plants are easier to handle with the machines. We use a crew of two, a man and a boy, with each machine; the man uses the machine and the boy carries a pail of trees and loads for the man. This work has now been pretty well standardized under the direction of Mr. H. A. Downs although we still hope to cut our costs somewhat. The record of our costs for the first plantation was, with purchased stock.

	Per 1,000
Cost of trees	$ 3 00
Express	39
Labor	7 29
Supervision	1 15
Incidentals	08
	$11 91

Our plantations for 1915 cost as follows with purchased stock:

	Per 1,000
Cost of trees	$ 3.00
Express	.279
Labor	2.799
Cartage	.029
Board	.087
Livery	.056
Supervision	.457
	$ 6,707

By using our own stock this cost can be reduced by about $5.50 per

White pine planted in 1908 on poor sandy gravel soil, Ontario stock, picture taken 1914.

acre. We usually plant 1500 to 1700 trees to the acre.

"A Million a Year."

We have so far only two difficulties, hares and hardwood brush. The former eat the tops of the young spruce and delay them for a year. Only a small proportion of the trees are eaten off and as soon as they get to be about a foot and a half high the danger is over. We keep them hunted down as much as possible. The hardwood brush on burnt and cut over lands grows so fast that the shade is excessive and this past summer we have tried pasturing our reindeer in our plantation with great success. They have eaten the brush off clean and the only damage to the planted trees has been a few killed in the roads which the deer make.

Our budget is based on planting a million trees a year, one for every one we cut and we look forward to a reserve of timber within six or eight miles of the mill which will be cheap to cut and to deliver. The parish in which we have begun operations has made a contract with us not to raise the valuation or assessment on our planted lands for twenty-five years and shown a most broad-minded spirit. We employ as far as we possibly can only labor from this parish on our work on these lands so that the benefits are mutual.

We expect an average cut, when the timber is ready, of at least ten times the average which we now cut on our limits and this with the short haul to the mill and the better quality of the timber will make an extremely valuable asset.

Fire Warnings on Game Tags

As a result of representations made by the Canadian Forestry Association, several of the provincial governments have decided to place upon the backs of licenses and other literature issued to sportsmen, a form of fire warning. The Chief Game Commissioner of Nova Scotia and the Deputy Minister of Lands and Mines for New Brunswick, have already undertaken to have the next issue of game tags contain a warning, and it is confidently expected that most of the other provinces will take similar action in the near future. The response to the Association's suggestion was most hearty.

Following is a form of fire warning which has been sent out to the officials interested:

To All Sportsmen: A Friendly Word

You have a personal interest in protecting the forests of this province from fire. The pleasures of fishing and hunting depend absolutely upon keeping the forests green.

Please adopt these sensible rules for your trip; they are endorsed and followed by the best fishermen and hunters everywhere:

Never toss away burning matches, cigars, cigarettes or pipe ashes.

Never start a fire in the woods among leaves, dry wood or against a log, or against a tree whether it be dead or alive. Build your fire wherever possible among rocks or gravel and away from trees.

Never start a fire in the moss or peat of a dry bog. It may smoulder for weeks and then leap into flame.

Never leave a fire until it is out. Camp fires "supposed to be out" have burned down thousands of acres of splendid woodland.

Remember: A forest is about the easiest thing on earth to set ablaze.

Increased Production and Forest Management

The Call of the Hour Applies as Closely to Forest Crops as to Grain Crops.

By R. H. Campbell,
Director of Forestry, Ottawa.

Production is being urged strongly on the Canadian people at the present time from official and other sources in order that the burdens placed on the country by the war may be met and the necessary supplies furnished the Allies. While this advice has been given or interpreted to relate particularly to food stuffs it is as important and as necessary in regard to other natural products and particularly timber.

The importance of timber in the economy of any country is well illustrated by the following extract from a recent letter received from the Hague, Holland, from a Belgian:

"I would like to receive through your intervention some notes and details concerning the timber and construction materials of Canada.

"In fact our little Belgium will have suffered much in consequence of the great European catastrophe and it is for us Belgians to think from now on as to the reconstruction of all this.

"After the war we will be obliged to utilize mainly the materials of our Allies or of the neutral countries. Timber will play a great part in the reconstruction of our country."

"Will It Pay?"

Belgium, with a population of nearly 600 to the square mile, has a forest area of 1,288,000 acres out of a total area of 7,275,000 acres and was increasing the forest area. The Belgian forests were a paying proposition but that is not the sole reason for having them. The even stronger reasons are expressed by Mr. N. I. Crahay, the Director General of the Belgian Forests, in reply to an enquiry as to whether forestry pays:—

"Ah! you English, you always want to know will it pay? In Belgium we look at the matter differently. We realize that the afforestation of waste lands affords an enormous amount of healthy work to the Belgian people, work required just when otherwise the men would be unemployed. We realize the importance of providing a large amount of home grown timber in view of the depletion of the world's timber supply, and we think too of the beneficial effects of forests, not only upon climate but upon the soil of the waste lands to the great advantage of the country."

The importance of the forest and its products in the economy of Canada is illustrated from the report of the last census which shows that there were 4,999 establishments engaged in making timber or lumber or in its re-manufacture; that the capital invested in them was $260,000,000; that there were 110,000 employees receiving $39,379,000 in

There are 4,999 establishments in Canada engaged in making timber or lumber or in its re-manufacture.

110,000 employees receive $39,379,000 in wages.

No other industry ranks as high in capital invested, number of employees and in wages paid.

The Federal and Provincial governments obtain from forest revenues $7,433,000 a year.

wages; that the cost of the materials was $94,000,000 and the value of the product $185,000,000. This group is the largest among the divisions of the census table of industries in capital invested, number of employees and wages paid, and is second in number of establishments, cost of material and value of products.

And even this does not include all the industries that use forest products for in other divisions are manufactures such as paper, vehicles, boats, agricultural implements and others in which large quantities of wood are used. In addition the firewood, the maple syrup and sugar, the handy supply for many purposes which helps out the farmer, makes us feel like echoing Mr. Crahay's words and applying them to Canada.

Government Gets Seven Millions.

The export of forest products and manufactures of wood (not including those only partially made of wood) in the fiscal year 1914-15 was valued at $53,344,616.

The revenues received by the different governments of Canada directly from the forests during the year 1913 were $7,433,770, so that their direct contribution to the public finances is important.

Greater production of timber may be brought about by three special means: (1) Protection: (2) Replanting: (3) Forest Management.

When greater production of agricultural crops is urged it means mainly putting a greater area under crop, the preparing of land, the sowing of seed.

The production of timber in Canada means largely the protection of a crop in various stages of development which has been sown and grown by a kindly providence and which we are only asked not to destroy. As the planting of the forest has cost us nothing in labor or in money we view with equanimity its destruction at all stages of immaturity and think there is no loss, never realizing, as has been well said, that the destruction of a forest crop is just as serious at any stage of its development as the destruction of an agricultural crop, and to say that there is no loss when trees of ten or fifteen years of age are burned up is as foolish as to say that a crop of wheat would be no loss if it were burned or hailed out in July before it was fully matured.

Education a Real Cure.

Production by the means of better protection is still far from perfect in Canada. Every year the losses are considerable and in the dry years they are always heavy, not always so much in the mature growth but in the immature stands that are making the most rapid production. The efforts of the Forestry Association, the Fire Preventive Associations, and the government departments have brought about improvements in protection but even yet the indifference and carelessness which cause disaster are appalling and the need for public education on this subject—the only sure means of accomplishing it by removing the cause—is pressing. Until practically every child in the country is ready to help in this form of production by doing his share in protection the appeal for greater production will be unavailing.

And while the individual may well take to heart the demand for more production the urgency is as great on those charged with the administration of the forests to organize on such a basis of permanent policy that the production from them may be permanent and uninterrupted by loss from fire or other causes. It is becoming increasingly clear that in all matters that affect the future of this or any other country there must be a looking forward and a present preparation for the needs of the future. Colonization should be so directed as to become permanent instead of shifting, agriculture should not result in impoverished land and its abandonment, the forest should be permanently producing, not evanescent. While the government urges on the individual the duty of greater production it should bend its own efforts in the same direction on the public domain.

Using the Waste Lands.

Production may be increased by planting a forest where none now exists, and it is in the doing of such work that we may realize how fortunate we are in that nature has done so much of the reproducing of the forest for us without our effort. By the cheapest methods that will have any adequate success reforestation on denuded land may be carried out at $7.00 to $12.00 per acre, and the returns at this rate are well worth while. Belgium, before the war, was planting waste land at a cost of $20.00 per acre and considered the investment a profitable one. There are unfortunately many miles of waste land in Canada where replanting will be required. Such work has been well begun by a few private owners and the success attending the efforts of some of these, and also of the governments of Ontario and Quebec have been already described in the Forestry Journal. The Dominion Government has assisted largely in the planting of trees on farms in the prairies and is now using the nursery developed for this purpose to supply stock for a vigorous policy of reforestation on denuded public lands which is being inaugurated.

Management Needed.

Production can be increased by proper forest management. It is not realized what an increase in production may be made by proper management of a forest but the examples from European practice are abundant of forests where the quantity and value of the production have been steadily increased through a series of years without a diminution and with even an increase in the stand itself. As an instance is the small forest of Couvet in Switzerland comprising 345 acres. It was put under technical management in 1883 with the result that in 1913 the annual cut had increased from 42.36 cubic feet per acre to 128.49, or three times the quantity; that the quantity of large timber in the cut had increased from 18% to 30%, and that the timber standing on the ground had slightly increased in quantity. That similar results are obtained over large areas and districts in Europe accentuates the possibilities. The low average production in Canada per acre as a result of the condition of the greater part of the forests shows that there is a large field for increasing production in this natural product. Outside of a few tentative efforts on small tracts no effort has been made in Canada to increase production by this means but the foresters of the Do-

By the cheapest methods that will have any adequate success, reforestation on denuded land may be carried out at $7.00 to $12.00 per acre and the returns at this rate are well worth while. Belgium before the war was planting waste lands at $20.00 an acre and considered the investment a profitable one.

minion are turning their attention towards it and studying the conditions that can be developed to bring it about. The ordinary man looking at such a productive forest may see and appreciate little of the knowledge and effort necessary to evolve such a forest, but it demands as high technical qualifications, as thorough knowledge of conditions and as careful calculation and management as do the problems of any other profession.

Development of the production and, as part of it, the improvement of the condition of the natural resources of Canada is the duty of the hour and not less with the forest resources, which affect public and domestic economy very vitally, than with any other, and a clear appreciation by public administrations and private citizens of the possibility and the necessity of such production and the means by which they can co-operate in it is an absolute necessity in order to bring it about.

Timber revenue in Canada for fiscal year ending 1913:

Timber and Grazing Branch (Dominion)	$ 431,196.60
Quebec	1,510,171.41
British Columbia	2,832,788.00
Ontario	1,979,125.81
Nova Scotia, (Crown Lands Revenue)	18,459.80
New Brunswick	662,031.00
Total	$ 7,433,772.62

Destruction of Scenic Beauties by Forest Fires

By Arthur O. Wheeler,

Director, Alpine Club of Canada.

The Secretary of the Canadian Forestry Association has asked me to express briefly the attitude of the Alpine Club of Canada towards forest conservation, and its protection from annual ravages by the fire demon. I am very pleased to do this, for, apart from extremely urgent economic reasons for the preservation of the magnificent Canadian forests, as a means of conserving the partially developed and undeveloped wealth of the country, there is much to be said.

Forest conservation affects primarily two of the main sources of Canada's income, viz.: the lumber industry, and the preservation of water supply for use on unforested lands and in the production of transmitted power. Of these two useful features the Canadian Forestry Journal has preached since the beginning, and it is apparent that the various governments are, in collaboration with the Conservation Commission, doing all that is at present possible to prevent the perennial occurrence of the devastating fires that are the curse of timbered districts. Yearly, such action is becoming more efficient as the value of the timber that remains and the future of the areas that are being reforested by natural or by artificial means are brought home to us.

Had these values been better appreciated in the past and had it been possible to employ the present precautions, Canada would have been wealthy to a much greater degree, and many wide areas would have

Lake Mildred, Jasper Park, Alberta, along the Grand Trunk Pacific Railway.

been clothed in the soft velvety greens of the pine, the spruce and the fir, instead of presenting dreary barrens filled with gaunt white skeletons that raise their scarred limbs to heaven in useless protest, and moan and screech like lost souls as the fierce winter winds whistle through them.

The Beauty of the Trees.

It is only of recent years that the public have become alive to the magnificent asset we possess in our mountain scenic regions. When the Canadian Pacific Railway was located in its present route across the various ranges of the Rockies the principal factor considered was the shortest possible alignment, and it was not until we were so taught by visitors from the older world that we understood that this popular transcontinental route opened up one of the world's most magnificent recreation grounds.

Lovers of Nature were quick to realize the wonderful scenic features presented by our cloud-capped peaks, wide snowfields, crystal ice falls, jewel-like lakes and rushing torrents, leaping in white cascades and sheer falls down tremendous rock precipices to the primeval forest depths in the valleys below. They have continued to grow in popularity until the palatial summer hotels of the Canadian Pacific Railway turn away hundreds of visitors from lack of accommodation.

Later, the Grand Trunk Pacific and the Canadian Northern Continental lines have opened up even wider areas of, if possible, still more wonderful alpine scenery in the vicinity of the northern passes of the main range.

The supreme effect of all this grand climax of alpine scenery depends for the contrasts of its colouring and the soft violet atmosphere that enshrouds it and enhances its beauty upon the magnificent setting of pine and fir forests that fill the valleys, and for which the Canadian Rockies are renowned the world

over. To our lasting regret be it said, that some of Nature's most striking masterpieces have here been irreparably destroyed by forest fires. Three cases in particular come to my mind, viz.:

The Avenue of Sticks.

1. Of all beautiful mountain tarns, Lake O'Hara, situated not far west of the C.P.R. crossing of the main range, is, perhaps, the most beautiful, although the same publicity is not given to it as to Lake Louise and Moraine Lake. In magnificence of surrounding snow-clad peak, rocky precipice and leaping waterfall it is a gem among gems. To reach it one has to pass through a stretch of several miles of burned sticks, where the forest has been destroyed by a fire that would have swept the entire valley but for a providential rock-slide that has cut right across it and so created a natural fire-break.

2. Moraine Lake, not far from Lake Louise, is another such beautiful spot, and yet the original forest bordering the road leading to it and covering the surrounding hillsides has been almost completely devastated by forest fires.

3. Towering above the Grand Trunk Pacific and Canadian Northern Railways as they wind in sinuous curves through the blue depths of the Fraser River Valley, the ice-bound summit of the highest peak of the Canadian Rockies, Mount Robson, rises in unequalled splendour—"a giant amongst giants and immeasurably supreme" wrote Milton and Cheadle in their "Northwest Passage by Land." On the north face of the massif, a wildly broken, crystal icefall tumbles for 5000 feet down the steep side and buries its nose in the turquoise blue waters of Berg Lake; so-called on account of the numerous chunks of ice that, with reports like cannon, break from the glacier and float on its surface, resembling miniature icebergs. Opposite this vast mountain mass, the centre of an alpine scene, unique the world over, are valley slopes from which the beautiy has gone forever. They present the bleached skeletons of a magnificent primeval forest that has been swept by fire, and although, as a compensation for the loss of the soft setting of forest green, Nature has spread a most wonderfully beautiful and varied carpet of alpine flowers, that loss has for all time marred the consumation of a scene the like of which could have nowhere else been found. The pity of it, the lasting pity of it, fills the beholder with unshed tears of rage and sorrow.

Hundreds of other cases, particularly along the lines of railway, can be cited but the above are strikingly typical and will suffice. As an opposite may be mentioned the forests surrounding Emerald Lake, near Field on the C.P.R. Here, an exquisite glacier lake of a wondrous jade colour is surrounded by wide virgin forests of varying shades of green, as yet untouched by fire. Behind, on all sides, towering peaks covered by perpetual snow reach to the clouds, wide stretches of ice shimmer in the sunshine and white waterfalls descend in sheer leaps from ledge to ledge of rock. There is no other spot in the mountains where the eye can dwell with such a satisfied feeling of rest on long stretches of soft, velvety green, intensified by a fiercely wild background, or where such a perfect feeling of peace can be obtained; and the Railway Company's delightful little chalet supplies all that can be desired to revitalise exhausted physical forces.

Not a Club for "Stunts."

There is a very generally fixed idea in the public mind that the Alpine Club of Canada is a species of high-grade athletic association, whose one and only aim is to train its members to daring stunts of climbing on next to impossible mountains; and that having once

Duffy's Peak, Canadian Rockies, along lines of Canadian Northern.

attained a summit and returned by a still more nearly impossible route the interest has ended. While such persons exist, they are a very small minority and form by no means its most lasting or most important section of members. Your real alpine climber is a lover of Nature in her primeval fastnesses—the outposts of the earth—where the forces of construction are at work, where all are extremes, and types of greatest beautiy lie side by side with those of grotesque ugliness. Here, in what may well be termed a factory of creation, are seen at work forces that lead to the construction of fertile plains and wide agricultural valleys thousands of miles distant, and as such are of intense interest to those who care to give them a careful study.

Moreover, apart from the wonderful and unexplained exhilaration that comes from climbing on snow and ice, and the overwhelming desire to see what lies beyond, your true alpine enthusiast glories in the wide-spreading spectacular panorama that is seen from a mountain top, when all in view is spread before him as on a living map. It is in places such as these, where the prescience of an Almighty Power is ever present, and which can only be attained through hard bodily exertion, that he loves for a brief space to enjoy the wonders that are spread at his feet.

It will thus be readily understood how deeply the true mountain lover deplores the ravages of the fire demon in the destruction of the forests that are so necessary to a complete realization of his ideals. Nowhere else in the world can similar forests to those of the Rocky Mountains be found, and it is their special charm in contrast with the vast deposits of snow and ice, for which the Canadian portion of the range is remarkable, that render the alpine districts of the North American continent unique, and fashioned on a pattern of their own.

Causes of Destruction.

Most of the large tracts of burned forest are of ancient origin and can be traced to either natural causes, or causes resulting from carelessness in the earlier days, when railways were pushing lines of communication into new districts. In those days precautions were at a minimum and many of the large burns occurred during construction. I have seen as many as four distinct fires going at the same time along a line of railway construction. Even now, when the law demands very strict precautions on the part of railway operations, fires are started by sparks from locomotives. It is true they are closely watched for and seldom get beyond control, but formerly the supervision and means of control were wholly inadequate and much destruction of valuable timber was the consequence. Once let a fire get a good hold and it was not extinguished until the winter had set in. I remember on one occasion moving my camp to the Columbia Valley not far south of Revelstoke. The forest at this point was on fire and to reach the ground selected, the team and wagon conveying the outfit had to pass through blazing bush. The bush in which we camped was burning on three sides. The crash of falling trees could be heard during the silence of the night and in the morning the tents would be thickly covered by ashes. Gangs of men were fighting the fire day and night and soon had it under control, but it was not finally extinguished until the first snow fell in September.

Who is Responsible?

Bush fires occurring at places situated far from the line of railways are usually attributed to campers, hunters, surveyors, prospectors and, most of all, to travelling Indians. While this may be so in a few isolated cases, I have found, during an experience of thirty-five summers spent in the wilds, that all such are as a rule careful to extinguish the

fires used by them; and particularly so at the present time when cautions are drilled into them by the authorities and by notices posted far and wide through the forests. And I may here say, that such notices are to be seen in all kinds of difficult and unlooked for places, and they speak vigorously for the thorough manner in which the fire guardians are doing their duty. Indians, as a habit, use small fires for cooking, generally inside their teepees, and are careful to extinguish them. It is in their own interests to do so, for fires destroy their camping grounds and drive the game to other parts.

It would seem that the most frequent causes are due to operations in the development of industries: railways, lumber camps, mining, road-making, etc., and it is in such connection that the law should be most strictly and rigidly enforced. It has been said that prospectors have been known to fire and burn large tracts of forest to make the work of prospecting easier. This is not probable, and certainly not at the present day. Prospectors travel rapidly over extended areas and most of their explorations and discoveries are above or near timber line, where burns are seldom seen.

Lightning's Effects.

It is a cause of much wonderment how bush fires could have started in tracts of forest destroyed long ago that are far from probable causes. In some cases this is undoubtedly due to lightning. I have several times seen trees in burned tracts that have been blasted and broken by lightning. I once saw the lightning strike in the forest and smoke go up directly afterwards. When on Mount Bonney, near Glacier Station in the Selkirks, an isolated patch of bush in the Fish Creek Valley was seen to be on fire. It is difficult to imagine how it could have been

A beautiful mountain side as seen from a Grand Trunk Pacific train passing through Bulkley Valley, British Columbia.

ignited except by some natural cause. Later, it was examined and did not seem a likely spot for a prospector or any other mortal to have been. It has been suggested that the rubbing together of the dry limbs of trees in windy weather will create sufficient friction to ignite them. The idea, however, seems somewhat far fetched.

In conclusion I may say that the chief delight of the alpine mind is in the glory of mountain scenery: the wonderful billows of cloud that wrap the white-clad giants in their clinging folds, the lights and shadows on snow and rock, the purple and violet haze that dims the valleys, and above all the contrast of colouring seen in the ever changing shades of the green forest as they pass from the bright gold of sunshine to the black depths of cloud shadow. Those who have climbed, or travelled by trail, in the wilds of the Rockies know what misery it means to spend hours climbing up slopes of down timber and burned sticks, to spend days chopping a path through miles of brulé and windfall, and can speak still more feelingly concerning this curse that hangs over the forest.

The Asset of Scenery.

The mountain scenery has proved of late years to be one of Canada's greatest future assets. Thousands come from all parts every summer to enjoy their holidays in the midst of these glories of Nature and to benefit by the wonderfully revitatizing effects of the clear, bracing atmosphere of the hills. The tourist business will be vastly greater in the future and will be a gold mine in the matter of revenue. Bush fires destroy the beauty of the scenery and cover the landscape with a pall of smoke. It is absolutely imperative that the most stringent measures be taken to preserve the scenic beauties of the forest that still remain to us, and with all such efforts the Alpine Club of Canada is very fully in sympathy.

Forestry in Switzerland

The Story of the Evolution of a Great National System That Holds Much Instruction For Canadians.

How the public forest policy of Switzerland came into being is most interestingly discussed in the last report of the Swiss Society of Foresters which has taken a large part in the development of forestry in Switzerland. The following is a partial resumé:

"The country is covered with marshes and great impenetrable forests." Such was the description the Roman historian Tacitus gave of Switzerland toward the year 100 A.D.

The forest was at the beginning a great obstacle to colonization. It was from the forests that it was necessary to gain the lands necessary for grazing and agriculture. In the time of the Roman occupation settlement had already been established in the more important communities and a good system of roads established. Settlement in the forest apparently proceeded much as it has done in Canada if some of the place names such as Eterpas (from the Latin *extirpare*) and Breuleux, Brulayie, etc., (from the French *bruler*, to burn) are any indication.

Communities were formed in which the houses and cultivated

lands were grouped together surrounded by common pasturage lands called "allmends" and by the forests, the chief function of which at that time was protection against enemies.

The battle of Sempach in 1384 by breaking the power of Austria and the nobles had an important effect, not only on the political liberty of Switzerland but on the economic development, as it left the public lands in the hands of the community instead of their being held by a monarch or divided among the nobles.

The First Forest Laws.

As the population increased the extent of forest decreased and the first evidence that the destruction of the forests was considered an evil were certain edicts of Charlemagne against the clearing of the forests. Fluctuations of population owing to the past and to the religious wars of the middle ages left little time for thought of the forest, but laws for its protection were passed from time to time which however considered only the limiting of consumption and not the management of the forest. The complaints of forest destruction became very numerous toward the end of the 14th and the beginning of the 15th century, and in the year 1597 there was issued by Henry IV an edict called "General Regulations for Waters and Forests," applicable to all forests,—state, communal or individual. These regulations were replaced in 1669 by new ones issued by Louis XIII and framed by Colbert, and these regulations remained in force until the French Revolution and had much influence on the French Code of 1827, the basis of the present policy of forest management in France.

During the 18th century the idea of absolutism in government and mercantilism in business strongly prevailed and burdens were placed on communal and private forests which only resulted in their being cleared as rapidly as possible while the state forests were used for the benefit of anything favored by the government. For instance, the development of mining was considered of great importance at that time, and cutting of timber for mining operations was permitted without control or management.

Destruction Rampant.

The result of the French Revolution was to establish the principle of individual liberty and initiative and the free application of this principle to the forests resulted in great destruction of the forests by the people in general and by conscienceless speculators. In France thirty per cent. of the forest passed out of the hands of the state and a similar policy prevailed throughout Europe.

Tree Repairing by Gun Fire

Here is a brand new scheme to lighten labor in trimming unusually tall trees. According to "Popular Mechanics Magazine" of Chicago, a ranch owner near San Jose, California, trims his eucalyptus trees with the aid of a high powered rifle. It is 120 feet from the ground to the lowest branches of the giant. The owner, it is said, takes the easy method of lopping off unnecessary limbs by a few moments of pleasant marksmanship.

From the excess of destruction arose the necessity of conservation and modern forest management.

In the 18th century there were numerous complaints in Switzerland of the devastation of the forests and the damage done by floods. The fear of a scarcity of wood increased and severe laws were passed but without result. Some judicious efforts were however made to remedy the situation. But there were many factors that rendered improvement very difficult. There was the lack of political cohesion in Switzerland, the jealousy between the municipalities, and the complete license of the mountaineers in the exploitation of the forests. All these reasons, added to by the increase of the population, were likely to bring about the ruin of the forests. The organization for supervision and control was wanting.

The remedy came from the excess of the evil. The public, alarmed, desired measures which would put an end to the depredations committed and thus commenced a campaign by means of which it was sought to arouse the public by informing them of the situation and the remedies necessary.

Beginning of Reforms.

The work was taken up by several societies among the leading ones being the Economic Society of the Canton of Berne and the Society of Natural Sciences of Zurich. These societies published many studies on the forests of Switzerland. It was not until the 19th century that the work thus done began to bear fruit. Several important works were published at the beginning of the century and in 1843 the Swiss Society of Foresters was created and has exercised a decisive influence on the development of forestry in that country. In 1855 the Federal Forest School at Zurich was established and in 1888 the federal station for Forest Research. The first federal forestry laws in 1876 came to furnish the indispensable basis for the development of the edifice of forestry. It was a result to some extent of the terrible inundations of 1868 which had at last opened the eyes of the entire people to the importance of the forest from the general point of view. To some extent the interest in silvicultural questions has penetrated all classes of the people. Little by little they have learned to estimate the forest not only because of the products they obtain from it, but also on account of numerous other advantages they bring. There is no need to fear now the alienation of the public forests. On the contrary the states and communes have the tendency to increase their forest domain either by the purchase of forest lands from private owners or by the reforesting of unproductive communal lands, of mountain pastures or of stony tracts.

DEER HUNTING

Don't take a pot shot at the figure in the cornfield. Its no credit to bag a scarecrow. Besides it may not be a scarecrow—these modern styles are deceiving.

Don't fire a round of buckshot into a haystack. There may be somebody sleeping inside it whot doesn't want to be called so early, either to this life or another.

In climbing over a fence with a loaded gun, first unload the weapon, let down the hammer, unscrew the barrel and knock off the sights to make it harmless.

Don't shoot at perfect strangers. Don't shoot at close friends. Be sociable.

Remember that a guide who works for a measly per diem and smoking tobacco isn't supposed to double as a moving target.

Be not deceived by any "moo" that may sound to the windward. How weak is the mere unsupported testimony of the spoken word.—(Exchange).

Should Sportsmen Be Registered?

Will Public Sentiment Support Such A Move Towards Better Protection of the Forests?

In order to sound public opinion upon a matter which has been considered by the Canadian Forestry Association, the Secretary addressed to a number of men in all parts of Canada a letter outlining briefly the suggestion for the registering of all fishermen, hunters, and others who make use of the forest country during the period of fire risk. Sportsmen, railway men, newspaper editors, government officers, etc., etc., received these inquiries and have already sent in many expressions of views.

It is recognized, of course, that no government would consider any such move during the war or if strong opposition from settlers, tourists, railway companies, hotels, etc., appeared likely. At the same time, it is an undoubted fact that serious annual losses to standing timber are caused by careless fishermen, hunters and others, making temporary use of the woods. Would it be possible to secure a record of sportsmen, with an outline of their proposed route, before they enter the forest so that rangers may be notified in advance of the need for extra vigilance in a particular neighborhood? That is the question which readers of the Journal should assist in answering. To minimize the amount of interference with the sportsman's holiday, it might be possible to have the issuer of the game license register at the same time the necessary particulars for fire guarding purposes and forward them immediately to the inspector or other official of the district to which the sportsman is bound. This would impose no extra bother upon the sportsman and the act itself would somewhat impress upon him the importance of being careful with fire on his trip.

The letter of inquiry read in part as follows:

"We have had under consideration for some time the advisability of requesting our provincial governments to consider the registration of all tourists, fishermen, hunters, prospectors and others who make occasional use of the forest. We have received suggestions from many quarters that fire guarding would be greatly facilitated if the rangers knew approximately the routes taken through the woods by these parties. It is asserted that registration could be carried out very easily without the appointment of new officials or the opening of new offices, by simple utilization of Crown Lands or other government offices at present in existence in most localities.

A system amounting practically to registration of tourists, fishermen, etc., is now in force for Algonquin Park, Ontario, so that the rangers are immediately made acquainted with the number of persons in their locality, and the route which they have planned to take. At least one of the Canadian lumber companies followed a system for some years of compelling all persons using their limits to register, giving details of their intended excursion. The company, forthwith, sent a ranger on their trail, and this system was instrumental through a long period of years in preventing many fires.

It is not suggested that registration should be enforced except during the months of actual fire risk—roughly, April 15th to November 15th."

Ontario's Railway Enforces Live Policy of Forest Guarding

Condition of Forest Growth Described by Member of Board—Conservation More Than a Theory.

By George W. Lee,
Commissioner, Temiskaming and Northern Ontario Railway Board.

The preservation of the forests along the line of the Temiskaming and Northern Ontario Railway, the means used to prevent forest fires occurring, the conservation of our timberlands, and the need of reforestration are live questions with the Commission and are questions the Commission have been—and will continue to be—intensely interested in. The matter is an important one, not alone for the present time, but for all time, the future especially. It is their desire to leave something to posterity that they have themselves largely enjoyed—diminished it will be, but not extinguished is their hope. They desire that much of the young forests will remain after they are gone to supply the wants of those following them, tempering the climate, conserving the rainfalls.

The southern part of this Railway runs through the Temagami Forest Reserve; part of it through timber berths from which the first growths have been removed by those holding the licenses—taken out in saw-logs and board timber.

The country near North Bay and for twenty miles north, was timbered several years ago. The lands were opened for settlement and to-day are partly occupied. There are considerable stretches of hardwood bush still remaining that is being drawn on yearly for stove-wood supply.

Fire Guards Cut.

From a point about forty miles north of North Bay to Latchford is the Temagami Forest Reserve, and, as stated, there are some timber berths interspersed. This section of our Line occupies about fifty-five miles. This Reserve is specially patrolled by the Fire Rangers of the T. & N. O. Ry. and the Government. Large spaces were cut away years ago, on both sides of the line, to form fire zones. Those zones were carefully cleaned up, brush, decayed wood, etc., being destroyed, and for years no fires of any extent have occurred.

North of Latchford, mileage 94, and on up the line to New Liskeard, mileage 113, was occupied by the Gillies Limits and all was largely given over to the prospector from the time of the entrance of the T. & N. O. Railway. All of the available timber—all of it that was fit for lumbering—has been removed. Some of it was taken out years ago, some of it quite recently, most of it was away before the advent of the Railway and the coming of the prospector. All but the younger growth was sawed for commercial uses.

From New Liskeard to Englehart (mileage 138):—This section of our line is situated in the "Clay Belt," and is largely occupied by settlers who to-day are getting the bush rather well cleared away and the

land is being used for farming purposes, for which it is eminently fitted.

North of Englehart for a few miles there is still land that is being used for farming, but it is somewhat broken in places. This brings us north to about Krugerdorf—from this on north for miles the country again is given over to the prospector and while good spaces of farm lands intersperse, the lands are generally rocky and have gravelly, stoney valleys. The country continues of this nature from near Krugerdorf (mileage 146) to Bourkes (mileage 183)—a distance of thirty-seven (37) miles. From Bourkes to Cochrane (mileage 253), or a distance of seventy (70) miles, the soil again makes for a farming country. We are here in the "Great Clay Belt."

Precautions Against Fire.

In all the distance from North Bay to Cochrane—along the Elk Lake, Charlton, Porcupine and Iroquois Falls branches—timber grew to great value—the older trees for present use, the younger trees for future use.

From the time of the entry of the steel into this forest, it has been the aim of both the Commission and the government to preserve the timber for the commercial uses it was fit for, or that it would be fit for after some years of added growth. With this end in view great care was taken to equip the locomotives with screens in the stacks, not only to meet the requirements of the regulations, but to absolutely prevent the locomotives from throwing fire, sparks, cut through the stacks, smaller meshes were used than prescribed by law. Extra precautions were taken in burning off right-of-ways; all timber growing on same being carefully brought in on land being cleared, so as the sides of line, when cleared, were as safe from fires as it was possible to make them. Circulars and posters are posted along the line in great quantities and written in many languages. All are warned and appealed to to beware of starting fires.

Besides the above—Fire Rangers patrolled the line from one end of it to the other—including all its branches. Those rangers were equipped with speeders, which during the time of the greatest drought were used to patrol the tracks after the passing of every train, and it was rarely that the incipient fire was not quenched before damage was done.

Good Record at Temagami.

Through the Temagami Forest Reserve, in all the years that the Railway has passed, there has not been a fire of any appreciable extent. True, there have been small areas burned over, but along the T. & N. O. track, I think I am safe in saying that there has been fewer fires of a destructive nature than on any other railway in Canada whose entire route was through great forests.

In the sections where farming is being carried on, the timber, as a matter of course, is disappearing. Most of it that was found on the farms has been utilized—is being utilized and rightly so. In no place has the same use been made of the forest growth as on those same farms—lumber, poles, ties, posts and piles have been cut for export, besides all that has been used for local and home building purposes.

Nature has in a great many places commenced reforestation and its growth is eagerly noted by the members of the Commission, their officials and employees.

Any one old enough to look back twenty-five years can realize how short the time has seemed and how terrible has been the destruction of the forests; what forests they were! They have vanished; have been annihilated by a generation who did not appreciate the value of conserving them.

Use of Tank Cars.

The Commission of the Temiskaming and Northern Ontario Railway feel that they realize the importance of the question of the preservation, conservation, of the remaining forests, and to that end take a large interest in this question. They have tank cars made especially for that purpose, situated at all junctional points, filled with water ready for the fire alarm. They have their sectionmen ready to go and fight fires any and everywhere along the line. Their engineers and train hands lend their help as often and whenever the occasion arises, settlers' pulpwood piles, other timber piles, as well as their homes being saved by train hands in the employ of the Commission. Realizing in every way the importance of this matter of conservation, the T. & N. O. Railway Commission is prepared to do all in their power to forward the good work and they are cultivating the same spirit in their employees and amongst the settlers and citizens of the Northland.

(Published in Collaboration with Canadian Society of Forest Engineers.)

Lieutenant H. K. Robinson, B. C. Forest Service, District Forester, Island Division, crossed to England in October with a draft of 50 men from the 5th C. G. Artillery, Victoria, and expects to proceed shortly to the Front.

Forest Ranger E. E. Frost, of Alberni, B.C., lately left Vancouver with a company of the "B. C. Pioneers" en route to Winnipeg on their way to the Front. Sergt.-Major Frost several years ago completed 21 years continuous service in the Imperial Army, and obtained an honourable discharge; he could not, however, resist the call of the present war.

Lieutenant A. J. Pickup who was Field Assistant in the Fort George Forest District during the season of 1914, is reported to have been killed in action, September 25th, in the Allied advance in France on that date.

On the Middle and South Forks of Pine River, situated in British Columbia, south of the Dominion Government Peace River Block, 4680 square miles was covered by reconnaissance this season.

Preliminary reports to hand show that in common with many other parts of the interior of B. C. destructive fires burned large areas within the last generation. It was found that 77% of the area covered was swept by fire 25 years ago, and an additional 10% about 8 years ago. 434 square miles of the balance has 4166 million feet of merchantable timber, consisting chiefly of Engelmann Spruce, Jack Pine, and Cottonwood, in the order named. It

will probably be safe to estimate that 25 billion feet originally stood on the area which was swept by fire. This land is now restocking.

The spruce is reported to have an average diameter of 18 inches, individual specimens reaching 40 inches diameter breast high. Jack Pine has an exceedingly good growth, a diameter breast high of 20 inches being reached with a trunk length of 40-60 feet without green limbs. Along the river bottoms Cottonwood up to 36 inches diameter were encountered.

The agricultural land amounts to 192 square miles, consisting of land partly open, some open meadows, and some restocking with young forest.

The merchantable timber lies mostly along good drivable streams and will be opened up by railway construction before many years.

Big game of every kind was encountered in large numbers. Mineral indications were noticed in places, so that it is to be expected that travellers will find their way into that region as soon as transportation facilities are better.

The timber is the property of the Province of British Columbia and the report mentions the necessity for efficient fire protection measures to safe-guard the merchantable timber, and the large areas of young growth, from fire.

A second reconnaissance party which worked this season on the North Fork of the Fraser River, and on the Parsnip River, recently completed field work for this year.

The area covered was 2545 square miles, of which 1737 square miles carries 10 billion feet of merchantable timber. On the Parsnip River, the timber consists of Engelmann Spruce and Balsam, the Spruce reaching a maximum diameter of 36 inches. The same species comprise the merchantable timber on the North Fork of the Fraser, but the average trees are larger.

Douglas Fir was seen occasionally on the Parsnip, and more often on the North Fork where over-mature stands up to 48 inches diameter occur.

On the North Fork also old stands of Hemlock and occasional Red Cedar occur, mostly in dying condition through old age.

The North Fork is untouched by fire, but on the Parsnip 150 square miles are burned over, 121 square miles being destroyed by one fire six years ago.

The climate appears to be wet, particularly on the North Fork, but severe lightning storms occur, which seem to cause most of the fires. The burned area is mostly restocking with Spruce and Jack Pine, the permanent type throughout the region being Spruce.

The timber on the Parsnip will be tapped by the P. G. E. Railway, and in mostly the property of the Province. The timber on the North Fork of the Fraser is tributary to the G.T.P. Railway.

Railway construction on the Parsnip will require careful supervision to protect the timber from fire.

Messrs. B. Guerin, Geo. H. Boisvert, and Ernest Menard, graduates of the Laval Forestry School and now of the Quebec Forest Service, have been elected to active membership in the Canadian Society of Forest Engineers. These gentlemen have done much in the way of exploration work in the northern part of the Province and have made some very interesting reports and studies. They all hold the rank of District Inspector.

Laboratories Formally Opened

Government and University United in Great Project of Reducing Waste in Forest Products.

The formal opening of the Forest Products Laboratories of Canada took place at Montreal on December 3rd. The event drew together a large representation of men prominent in governmental, commercial and engineering life and provided an opportunity for bringing to the attention of many interested people the highly important work which the laboratories are carrying on.

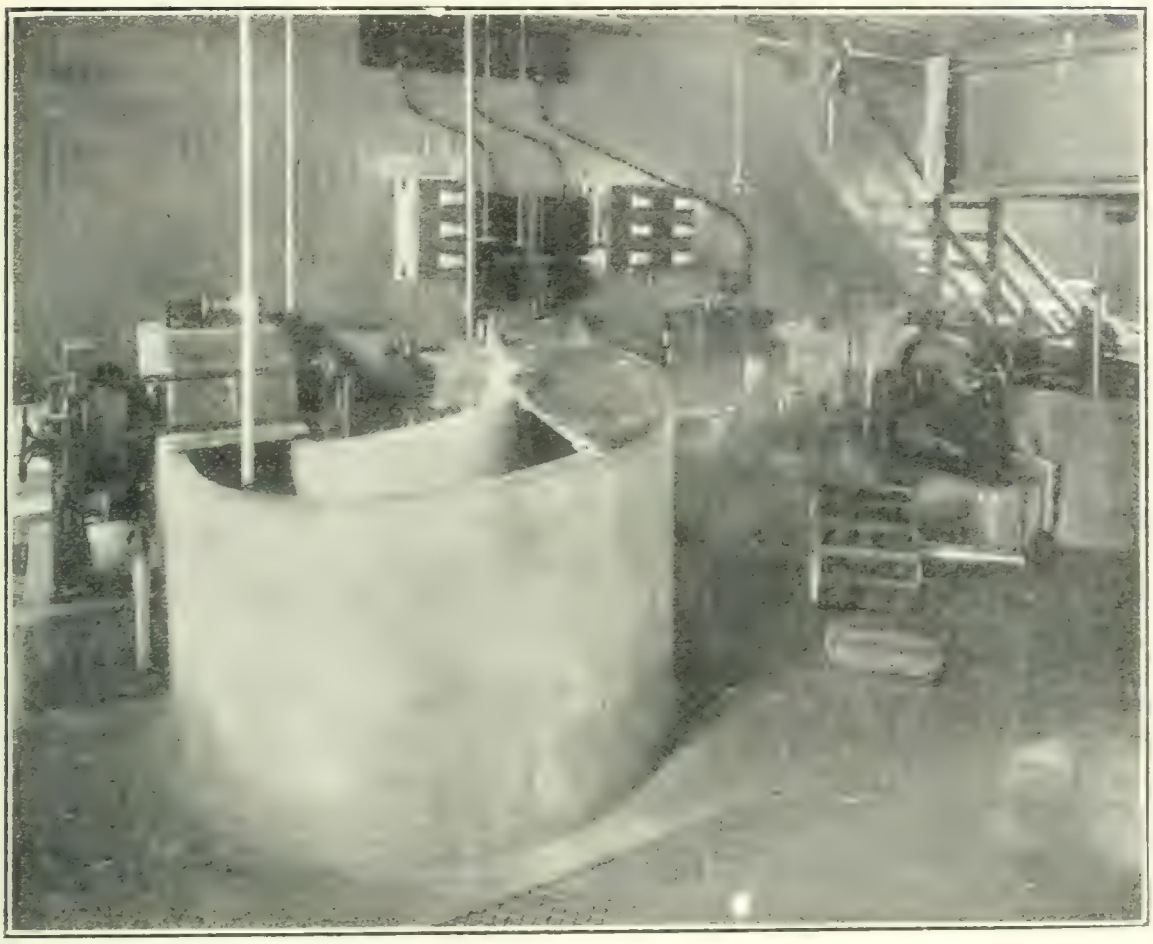
The history of the inauguration of the Laboratories, and a careful description of the equipment were contained in the July, 1915, issue of the Canadian Forestry Journal and can readily be referred to by readers of this issue. Of the incidents surrounding the formal opening on December 3rd, something may well be said.

The Forest Products Laboratories of Canada were established in 1913 under the Forestry Branch of the Department of the Interior. Montreal was selected for their location by reason of the valuable facilities which McGill University offered to place at their disposal. This co-operation of University and Government which was so strinkingly evident to those present at the formal opening has resulted in a success otherwise improbable. The University has provided quarters for the laboratory work and the Department of the Interior bears the expense of salaries and equipment. This eager relationship between the University and the practical problems of one of the greatest of our industries testifies to the truth of Sir William Peterson's remarks that McGill's contribution to Canadian life is in line with the outstanding needs of the times and that "we professors are the livest lot of men in the country."

The Aim of Conservation.

The function of the laboratories is, by itself, quite distinct, although sharing with all forestry organizations in the aim of conservation. The laboratories are concerned alone with the utilization of raw materials and employ the agencies of chemistry, physics, and engineering. Until one comes into touch with the lack of information relating to Canadian woods, methods of using raw materials and forest waste there can be no full appreciation of the great service capable of being rendered by an institution of this kind. The wood using industries of Canada are running far from the path of maximum economy. Thousands of questions asked in the course of a year, questions demanding scientifically exact answers have gone begging. Commercial companies, realizing the need of a central bureau of research and experimentation for the whole Dominion, were in no position themselves to solve the problem. Under the administration of Hon. Dr. Roche, and with the advice of Mr. R. H. Campbell, Director of Forestry, the Forest Products Laboratories came into existence. They have the hearty support of the industries identified with forest products and have already rendered substantial service.

Following a brief address by Hon. Dr. Roche, the guests started upon their interesting travels. The building containing a complete experimental paper mill proved of keen



Double and single beaters in the Experimental Paper Mill.

interest. Here was seen in operation the process of turning wet pulp to various grades of paper, from the manipulation of the pulp in the "beaters," the flowing across the wires, the drying, and winding. More than ordinarily interesting was the presentation to all visitors of samples of excellent blotting paper recently taken from the machine—the first of the product, by the way, to be made in the Dominion.

There was seen also the Department of Timber tests where a Hatt-Turner Impact testing machine, a 30,000 lb. Olsen Universal machine, a 200,000 lb. Wicksteed and 150,000 lb. Emery machines are available for experiments in establishing the strength characteristics of important Canadian wood species. The testing proceedure includes eight strength tests, static bending, compression parallel to grain, compression perpendicular to grain, shear, tension, impact bending, cleavage and hardness. Important work has been accomplished here in the testing of Nova Scotia mine timbers. Timber physics forms yet another major division of the laboratories in which the equipment includes microtome, microscopes, photomicrographic apparatus, projection lantern, cameras, electric ovens, autoclave, balances and so forth. The work has to do largely with determining the physical and structural properties of wood by extended and varied tests. The Division of Wood Preservation was organized in October, 1914, and includes the study of wood preservatives and methods of treating wood to prolong the life of railroad ties, paving blocks, etc.

Curbing the Waste.

The inspection of the Laboratories was followed by a number of brief addresses. Hon. Dr. Roche expressed the sense of satisfaction he felt in having brought into existence during his administration of the Department of the Interior an institu-

tion of such permanent and practical service as the Forest Products Laboratories. He realized he said that Canada had been wasteful of her forest wealth, allowing the living forests to be preyed upon by fire, but that a new sense of the importance of conserving the raw materials of a great industry had come upon the country, one expression of which was the wide interest taken in the Forest Products Laboratories. It was the aim of the Laboratories to seek out better methods of wood utilization and to discover uses for what was now cast aside. Manufacturers would learn to avail themselves of the institution for the solving of their commercial problems, the improvement and cheapening of processes. There would be given to the country the great asset of scientifically trained men, capable of applying their talents in the service of one of the foremost Canadian industries.

The Cost of "Not Doing."

Sir William Peterson, Principal of McGill University, said he was proud to be the ally of the Minister of the Interior in the establishing of the Laboratories, since he believed that a University should be a centre of practical use to the community as well as a seat of learning. This was the first example of what could be done in the advancement of applied science by co-operation between the University and the Government. "We do not want ever to have to go to Germany for anything again," observed Sir William, "and we want to collaborate with the Government to devise means to avoid this. It is not a question of what it will cost to do the thing but what it will cost not to do it."

Hon. Sydney Fisher warmly congratulated Hon. Dr. Roche upon the general standard of efficiency which had characterized his departmental management, and emphasized the necessity for efficient management of natural resources, for which purpose the Laboratories had been brought into being. Brief addresses were given by Mr. T. H. Wardleworth, President of the Society of Chemical Industry, Dr. Hugh P. Baker, Dean of the Forestry Faculty, Syracuse University, New York, and Mr. R. H. Campbell, Director of Forestry.

Following is a list of those present:—

Government:—Hon. W. J. Roche, Minister of the Interior, Ottawa; R. H. Campbell, Director of Forestry, Dept. of Interior; Dr. A. McGill, Chief Analyst, Dept. of Inland Revenue; Dr. C. G. Hewitt, D.Sc., Dominion Entomologist, Dept. of Agriculture; R. Grigg, Commissioner of Commerce, Dept. of Trade and Commerce; J. M. Macoun, C.M.G., Asst. Botanist, Geological Survey, Department of Mines, Ottawa.

Advisory Committee:—F. Howard Wilson; J. A. DeCew; Dr. R. F. Ruttan, Dept. of Chemistry, McGill University; Carl Riordon, Riordon Pulp & Paper Co., Ltd.; Prof. H. M. Mackay, Dept. of Civil Engineering, McGill University; R. O. Sweezey, Royal Military College, Kingston; Dr. Frank D. Adams, McGill University.

McGill University: — Sir Wm. Peterson, K.C.M.G., McGill University; Mr. Walter Vaughan, Secretary McGill University; Dr. H. T. Barnes, F.R.S., McGill University; Dr. J. B. Porter, Faculty of Applied Science, McGill University; Prof. H. O. Keay, Prof. E. Brown, Prof. C. H. McLeod, Faculty of Applied Science, McGill University; Dr. F. C. Harrison, Principal Macdonald College; Dr. J. F. Snell, Macdonald College; Prof. Carrie M. Derick, McGill University.

Foresters: — Ellwood Wilson, Laurentide Co., Ltd., Grand Mere, Quebec; Clyde Leavitt, Forester, Commission of Conservation, Ottawa; E. J. Zavitz, Provincial Forester, Parliament Bldgs., Toronto.

Canadian Forestry Association:—Robson Black, Secretary, Ottawa.

Canadian Pulp and Paper Association:—C. Howard Smith, Howard Smith Paper Mills, Ltd., Montreal.

Canadian Manufacturers' Association:—J. H. Sherrard, Pres., Can. Mfrs' Association; George A. Slater, Vice-Pres., Can. Mfrs' Association; Roy L. Campbell, Sec., Can. Mfrs' Association, Montreal.

Canadian Society of Civil Engineers:—R. A. Ross, Vice-Pres. Can. Soc. Civil Engineers; Walter J. Francis, Chairman, Can. Soc. Civil Engineers; A. Surveyer, Councillor, Can. Soc. Civil Engineers, Montreal.

Society of Chemical Industry:—T. H. Wardleworth, Chairman, Society of Chemical Industry, Montreal.

Canadian Roalroads:— M. G. Blaiklock, Chief Engineer, Maintenance of Way, G.T.R., Montreal; C. E. E. Ussher, Passenger Traffic Agent, C.P.R., Montreal; B. M. Winegar, Forest Inspector, C.P.R., Montreal.

Canadian Lumbermen's Association:—Frank Hawkins, Sec'y, Can. Lumbermen's Association, Ottawa.

Other guests were: Hon. Sydney Fisher, Ottawa; Howard Murray, Vice-Pres., Shawinigan Water and Power Company, Montreal; Smeaton White, Capt. J. A. Weir Johnson, A.O.D., Montreal; Mr. Wm. Kelly, Canadian Explosives, Ltd., Montreal; J. B. Bell, Chief Chemist Canadian Explosives, Ltd., Montreal; William Little, Westmount, P.Q.; T. L. Crossley, Laboratory of Dr. J. T. Donald, Montreal; Dr. Hugh P. Baker, Syracuse University, New Haven, Connecticut; "Canada Lumberman," Mr. Holliday; "Paper Trade Journal," Mr. C. L. Sibley.

The organization of the Laboratories at the present time is as follows:

J. S. Bates, Superintendent; W. B. Campbell, Assistant Superintendent (on active service); H. N. Lee, Acting Chief, Division of Timber Physics; R. W. Sterns, Chief, Division of Timber Tests; O. F. Bryant, Acting Chief, Division of Pulp and Paper; W. G. Mitchell, Chief, Division of Wood Preservation.

The permanent staff numbers thirty at the present time. Seven members of the staff have left on active military service. There are seventeen technical men actually on duty at the Laboratories. The balance of the staff includes office staff, etc., in the Division of Administration.

Late Abraham Knechtel

The ranks of professional foresters lost one of their valued members recently in the death of Abraham Knechtel, Chief Forester, Dominion Parks Branch of the Department of the Interior, and a member of the Canadian Forestry Association.

The late Mr. Knechtel was born at Brussels, Ontario, in 1859, and was in his 56th year. He was one of the pioneers in scientific forestry on this continent. He was graduated in 1900 from Michigan Agricultural College, receiving the degree of Bachelor of Science. He then took a special forestry course at Cornell University, receiving the degree of forest engineer. For seven years prior to his coming to Ottawa to take up work in the forestry branch of the Dominion Government he was attached to the forest, fish and game commission of the State of New York and in that connection laid out the first forest plantation established by the state. In 1904 he was sent to St. Louis Exposition to lay out a forest nursery there for the commission. In recognition of his services there he received a special medal. In the same year he was sent by the New York Commission to Europe to study forest conditions and practice there. For several years Mr. Knechtel also delivered lectures in New York under the auspices of the New York State School Board.

Mr. Knechtel is survived by his widow, Mary E. C. Knechtel, grand daughter of the late Colonel Wm. Young and the late Lieut. James Eaton, both of Leeds County, two sons, Otto Young and Maxwell McMichael; and two daughters, Florence Eaton and Miriam Margaret.

Ready-Prepared Lectures on Forest Questions

The Secretary has in course of preparation a series of lectures on interesting topics identified with forest protection, which will be sent upon request to any part of Canada. These ready-to-hand lectures will be accompanied by sets of twenty-five or fifty lantern slides which will sufficiently illustrate the subject. The manuscript and slides will be sent out at the Association's expense and the first of these will probably be ready about January 15th.

This is a new departure and is designed to meet a demand for popular talks on forest matters. Requests have been .received from Scout Masters, clergymen, women's clubs, etc., in many parts of the country. The distribution of these lectures will materially supplement the series to be delivered personally by the Secretary.

Newspaper Cartoons

Another recent undertaking by the Association has been a series of newspaper cartoons, drawn by a well-known Canadian artist, H. B. Moyer, of the Toronto Star, dealing with forest protection topics. The first of these is now in the hands of about thirty Ontario newspapers, as the subject referred particularly to that province.

The Association takes care of wide distribution by means of paper matrices and stereotypes (processes of cheap duplication) which are placed with editors in whatever part of Canada the cartoon was designed to apply to. Copies of the cartoons will be reproduced in future issues of the Forestry Journal. The newspaper cartoon is one of the hardest-hitting devices with which public opinion can be affected and may be employed to splendid effect in the work of the Canadian Forestry Association.

Stories for School-children

Talks on Forestry for children are being sent out by the Association to school teachers under various attractive headings. The matter is all in story or semi-story form and in many cases the manuscripts furnished to teachers will be accompanied by sets of photographs which can be passed about a class room.

In nearly all Canadian schools a portion of Friday afternoon is devoted to miscellaneous reading and it has been shown that simple talks on forest subjects would be acceptable to teachers and pupils alike. In this way, the inculcation of the rudiments of Forestry may be assisted from a new angle.

Government Ownership

The outlook for the practice of forestry in Canada is vastly improved by the fact that the fundamental ownership of a very large percentage of non-agricultural lands has been retained by the Crown, instead of passing into private ownership, as has so largely taken place in the United States. Very seldom can private land-owners afford to hold cut-over forest lands for successive crops of timber. This is essentially a governmental function, on account of the long-time element involved.

B. C. System of Timber Leases

Hon. W. R. Ross Explains Various Tenures—Transportation Problem Alone Blocks Great Prosperity.

The energetic campaign for the extension of the lumber export trade of British Columbia has directed attention to the timber resources of that Province, their present development and prospects. In an interview, the Hon. W. R. Ross, Minister of Lands, said:—

"Many vague estimates of the extent of British Columbia's forests have been put forward in past years. Because we need reliable information in order to manage our forests intelligently I began a forest survey in 1912. A very considerable area has already been covered by the cruisers engaged in this survey. The figures obtained give us something definite to go upon. Besides the eight and one third million acres under timber license, a million acres under old timber leases, a million acres of deeded timberland, three quarters of a million acres held under railway grants—besides these alienations we find that the Crown Timber Reserve, created in 1907, is very considerable. For instance, in entering the results of various forest surveys on the maps last year there were one million acres of reserve timberland dealt with, apart from very large areas containing lesser stands of timber and pulpwood. Hence, the estimate of 350 billion feet of merchantable timber now awaiting cutting in the Province is being called into question as it becomes more and more probable that the effective total will reach 400 billion."

B. C.'s Wood Assets.

"Take the Coast forests—say a solid third is Douglas Fir, which taken all around is the finest all round wood in the world; over one-fifth is Cedar—British Columbia is pre-eminently the Cedar region of America, thanks to the Coast rainfall. Then think of our immense stand of Western Hemlock. The world is now beginning to realize what Western Hemlock is. Our pulp and paper mills have done great things with it already, but the big uses of this wood are only just beginning. Western Hemlock is destined to take the place of Eastern White Pine for very many purposes, and at no distant date. Then take our fine interior forests. Seven thousand out of 13,600 square miles of timber licenses are East of the Cascades Mountains, so you see our interior country is pretty strongly represented in the timber asset."

"The financial world naturally takes a particular interest in the question of tenure," the interviewer observed. "Would you mind running over the main features of the various tenures?"

"Crown grant timber, of course, is just deeded timber—there is nothing to explain about that," Mr. Ross replied. "Then the old leases are simple enough—rentals of 10 or 15 cents per acre per annum and a royalty on cut logs of 50 cents are the terms in most cases up to the years 1921 to 1925, during which period the bulk of these leases will come up for renewal for 21 years ahead, obtaining whatever rates of rental and royalty are then provided by statute. The timber license tenure is rather more complicated, however."

"I think it is somewhat imperfectly understood outside the Province,

except among those who are directly concerned, Mr. Ross."

The Problem of Tenure.

"The original problem was extremely complicated," said the Minister. "But we've straightened all that out now, and I believe that I may claim that the result is a thoroughly sound piece of constructive legislation. It was this way,—an immense timber resource was idle and unproductive, contributing next to nothing to the development of the Province. We needed revenue, but we were firmly determined not to sacrifice one jot or title of the people's heritage. So, we permitted the staking of timberlands — anyone could stake cutting rights over a square mile of timber by paying $140 a year rental and paying a certain stumpage (we call it royalty) on such logs as he might actually cut. That was a good proposition for the lumberman who wanted timber for a mill and did not want to sink capital in buying stumpage ahead. But there were strings on this concession, in the public interest. Neither the annual rental (which is a sort of interest charge) nor the royalty on cut logs was fixed. They could be changed at any time to meet any rise in timber values that might occur. So the public was well protected. On the other hand, it was left to the changing opinion of successive legislatures—(ours are elected every four years)—to decide what rental or royalty should be charged. That uncertainty gave British Columbia timber licenses a weak standing as securities, and made the financing of the lumber business difficult in consequence.

Rentals for Long Period.

"For a time no solution of this problem could be found. In the end, with the co-operation of the parties affected, a basic principle was worked out, and then we passed the Timber Royalty Act of 1914. That gave security of tenure to the licencee—fixed a rental for forty-five years ahead and a royalty on a sliding scale. If the wholesale selling price of lumber throughout the Province goes up above a certain figure the royalty goes up. If it goes below that figure there is a definite royalty charge to correspond. The people of this Province and the lumbering industry are, therefore, partners in the timber. The terms of the partnership are straightly defined. There is no more room for uncertainty, as is the case with timber or timberlands in the Western States for example, where taxation may increase several hundred per cent. in a few short years. The timber license of British Columbia is henceforward an absolute safe security."

"With regard to the development of the lumber business, Mr. Ross, what have you to say concerning that?"

"Just a matter of transportation. The Province has developed a fine system of railway transportation inland; so far we have not done the same seawards. There has been chronic congestion at the Coast, a lack of sea-going tonnage that has been stifling our export lumber trade. Remove that and the rest follows—expansion in the lumbering business, foreign markets, activity in every form of commerce."

"A few figures to show the present stage of the lumbering industry in the Province."

No Lack of Plant.

"A mill capacity of 2½ billion feet—we shall soon increase that when we have ocean transportation to take up the business offerings from all over the world that we are obliged to turn down to-day. An actual output, in these hard war times, valued at twenty-nine million dollars, a thousand million shingles shipped to market in the year; the new pulp and paper industry producing three million dollars a year already; some of the largest plants in the world for saw and paper mills—these are a few points that show our lumbermens'

activity. Let us once secure ocean transportation and, make no mistake there will be doings in the lumbering business, and a rise in the value of British Columbia stumpage. And this Government is running an advertising campaign directed at the Prairie, Eastern and foreign consumer of lumber that is going to make an appreciable difference to the demand for our forest products. We are out to do our level best to secure prosperity through a prosperous lumbering industry based on a wealth of timber resources."

A Winter Forest Survey Party in Northern Alberta.

Getting Out British Columbia's Timber Crop.

THE PROMISE OF "PERMANENT LUMBERING"

One of the greatest engineering undertakings in the history of Canadian lumbering—reinforced concrete dam at High Falls, Lievre River, P.Q., in connection with the Maclaren limits. The structure contains a log chute, and electrical power is developed.

THE ANNUAL MEETING

of the

CANADIAN FORESTRY ASSOCIATION

will be held at the

CHATEAU LAURIER, OTTAWA

on

THURSDAY, JANUARY 20th, 1916.

This meeting promises to one of the best in the history of the Association. Every member who can be in Ottawa on that date should make a point of attending.

By co-operation of those organizations having more or less common interests, four annual meetings will be grouped within the three day period, January 18-20. The order is as follows:

Commission of Conservation—January 18, 19.

Canadian Lumbermen's Association—January 19.

Canadian Forestry Association—January 20.

Canadian Society of Forest Engineers—January 18.

On the evening of Wednesday, the 19th, a joint banquet will be held at the Chateau Laurier. Guests are asked to give ample notice of their intention to attend that event.

Forestry questions will occupy a substantial part of the programme of the Commission of Conservation, and the Canadian Forestry Association will devote part of the morning and all of the afternoon to addresses and discussions. While it has been impossible at the date of publication of this Journal to give details of the programmes, the Association is assured of the presence of important and interesting speakers, among whom will be Hon. W. R. Brown, President of the New Hampshire Society for the Protection of the Forests, and head of the Brown Corporation of La Tuque, P.Q.

Lumbermen and Forestry

The View of J. E. Rhodes, an American Lumberman—Reforestation the Business of Governments, not Corporations.

The National Lumber Manufacturers' Association is a federation of practically all of the associations of lumber manufacturers in the United States, and represents a combined membership of about 1,500 of the largest saw mills of the country, having an annual output of over fourteen billions of feet of lumber. The lumber manufacturers have taken a general interest in forestry. They recognize that timber is being cut much faster than it is reproducing itself, and that necessarily lumber can be consumed at the present rate only a few years. It is now generally admitted by lumbermen that the climax of lumber production in this country has been reached and passed. There was a time when it was thought that the great white pine forests of the Northern States were inexhaustible, but the generation of the lumbermen now passing has seen the white pine forests nearly cut off. As they disappeared timber of other sections has increased in value. It is now believed that the climax of the production of yellow pine of the Southern States has been reached.

Conservative Methods.

The evolution of economic conditions in the lumber business is, therefore, just beginning to make possible the consideration of forestry methods in practical logging operations. The lumber manufacturers admit (those of them whose operations will extend over ten years or more) that conservative methods must soon be applied to their business. With each material reduction in the output will come an increased value of standing timber, and when the price of stumpage has risen to the necessary point (and other conditions being favorable), scientific forestry will surely be adopted by lumbermen.

They are too intelligent business men not to undertake those methods which will perpetuate their supplies of raw material and thus prolong their business. If forestry cannot be undertaken with profitable results, it cannot be considered at all, as individuals cannot be expected to conduct a work of this kind at a loss to themselves no matter how much they may be prompted by sentiment or regard for future generations. The price of timber products must reach a point where it will pay to grow trees (or at least to conserve virgin timber), or forestry cannot be thought of. The time when forestry can be seriously considered by the lumbermen, therefore, depends entirely upon the development of economic conditions. The lumbermen generally appreciate that eventually the cutting of timber must be in proportion to its annual increase and growth, but they feel that that time is in the distant future.

Were Critics Right?

Lumbermen resent the criticism which have been made against them to the effect that they have wasted the nation's resources. They have utilized every part of the tree from which a profit could be realized. Much has been said about the reckless waste of our timber resources, but very little has been left in the woods to rot and burn which could have been saved. Men are not in

ADD A MEMBER

You can add a member to the Canadian Forestry Association in a few moments of your time.

Will you?

The Association is not only holding its old members but has grown by several hundreds during War Year.

Send the Secretary the name of a friend who might be interested. Even better, ASK the friend to let his name be entered as a member. The fee is one dollar a year and brings the Canadian Forestry Journal and other publications.

Not a few members have sent in a friend's name and have paid the membership fee on his behalf.

No reason exists why the Canadian Forestry Association should not grow substantially between the receipt of this issue of the Journal and the Annual Meeting, January 20, 1916.

The answer is for YOU to give. Kindly fill in one of these blanks right now.

Secretary, Canadian Forestry Association,
Booth Bldg., Ottawa.

Please write to the following regarding membership in the Association:

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Secretary, Canadian Forestry Association,
Booth Bldg., Ottawa.

Please enter the following as new members of the Association for which I enclose the annual fee of one dollar each:

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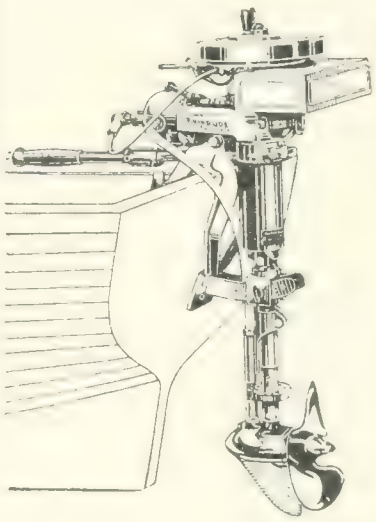
EVINRUDE



2 H. P. and 3½ H. P.

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Very efficient for **towing** heavy loads.

All motors are equipped with reversible, high tension **magneto** and **Maxim Silencer.**

Drive a rowboat up to 8 miles and a canoe up to 12 miles an hour.

Our 1915 models embrace all the unequalled features of the 1914 machines, plus the new and exclusive Evinrude **Automatic Reverse** which adds 100 per cent. flexibility and enables Evinrude equipped craft to manoeuvre in a marvelous fashion.

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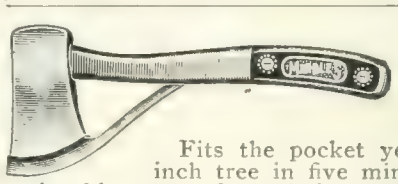
the habit of destroying material from which any value can be derived. If anything has been wasted the public must share its responsibility with the lumbermen. As forest products have advanced in value, it has been possible for the lumbermen to utilize an increasing proportion of the raw material which he has found on the land.

The remarkable development of our country, cultivated and settled in a century and a half, could not have been accomplished without the sacrifice of the forests, providing as they have the cheapest building material ever known. We may ask if the results have not justified the sacrifice. Homes, cheap, compared with those obtainable under any other conditions, have been furnished to millions of people and great areas of country originally covered with the forests are now producing annual farm crops of more value every year than all of the trees they replace.

Lumbermen make a distinction between reforestation (or the planting of a new crop of trees) and scientific forestry methods as applied to logging operations. Scientific forestry, in logging virgin timber, as we understand it, means the cutting of the existing forest so that it may have a chance to reproduce itself. This involves the cutting of trees of certain species by diameter limits, leaving the younger timber where under certain conditions it may be expected to increase in size; leaving also matured trees for seeding purposes,



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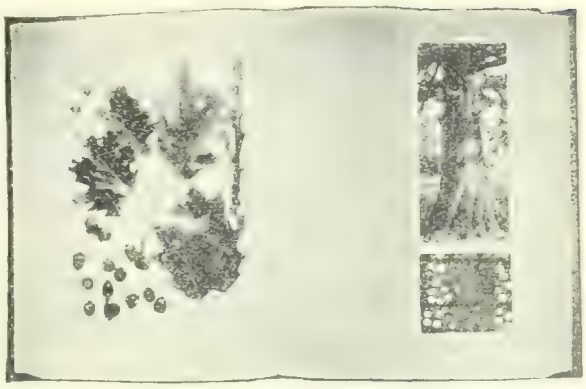
ascertaining the rate of growth of certain species in different localities, knowledge of the exact relation between forest growth and lumber consumption, and many similar subjects, all of which the lumbermen are willing to admit must be worked out by the technical forester.

Pass on the Cost.

Scientific forestry methods along the lines suggested mean large additional expense compared to the present manner of cutting timber. This increased cost must, of course, be borne in the end by the consumer, and just as soon as the consumer is willing to stand it, I state again that these methods will be gladly undertaken by the lumbermen. Cheap virgin timber is becoming hard to find. Nearly all of the merchantable timber on the North American continent, with the exception of large tracts in Mexico, has been purchased. For this reason, many timber owners are looking forward to the day when it may be possible to put what forests they now own upon a permanently paying basis by cutting it in proportion to its growth.

Reforestation, or the planting of a new crop of trees upon cut-over or barren lands not suitable for agriculture, the lumbermen believe must be done by the state and national governments. This is a work which cannot be considered by the present generation of men as a profitable enterprise or investment, except in a very minor way, as the returns to be expected are inadequate and success too uncertain. The length of time to plant and mature a profitable crop of timber is too great to interest Americans. It is certain that the individual must pay taxes in some form or other while the state is exempt. The actual planting of trees from the seed for the benefit of future generations, if it is done to an extent sufficient to insure a future supply of lumber, in



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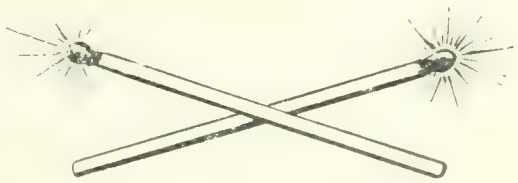

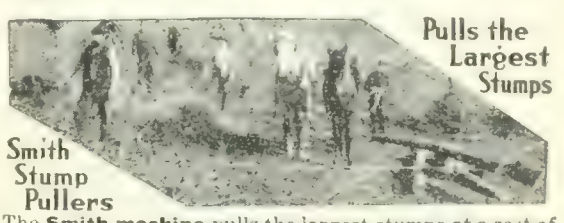

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anything like adequate volume, must be done by the State or government. The lumbermen are not opposed to the efforts being made by the federal government or by any of the states to preserve the timber lands publicly owned. They are almost unanimously opposed to the federal government transferring any of the national forests to the states in which they are located. In many localities lumbermen are taking a leading part in the movement to encourage the state governments to acquire and maintain state forests.

Next in importance to taxation, the future of forestry in America depends upon reducing the enormous loss from forest fires. The lumbermen have taken a most commendable part, especially in the western states, in the efforts to reduce this enormous loss. They have co-operated actively with the government and state officials to reduce the number of forest fires, and very satisfactory results have been obtained during the last three years. If time permitted, I could explain at length the work of the various forest protective associations of the western states in which the lumbermen are the prime movers, and also of their efforts to secure the enactment of forest protection laws by various State Legislatures. No opportunity is being lost by the lumbermen to impress every man, woman and child with the truth that every tree which burns is a direct menace to the community. The time is near at hand when the great annual losses from forest fires in this country will be reduced to a minimum.—(J. E. Rhodes, in an address to The American Forestry Association.)

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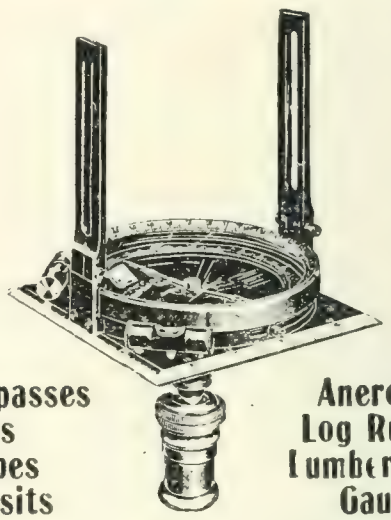

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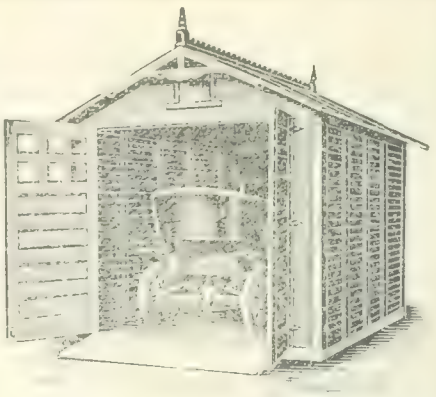

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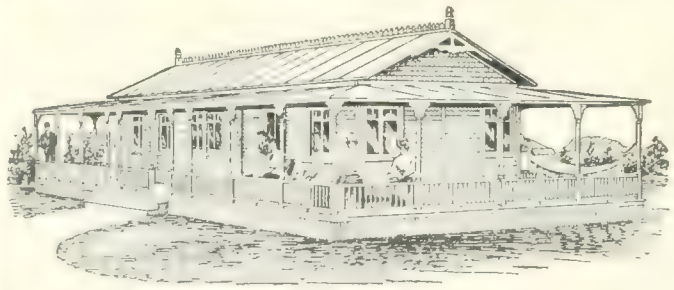

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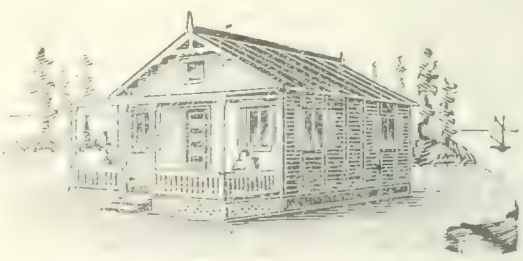

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The woodlot is, perhaps, the only farm crop to which the farmer has not considered it necessary to devote any care. His grains are sowed on carefully prepared soil; his vegatables are cultivated, and his fruit trees are pruned and sprayed; his forest trees alone are left to look out for themselves. This is the more remarkable when it is taken into consideration that any labor expended on the woodlot not only improves the final crop, but ordinarily pays for itself as well. No detailed technical knowledge is required for the work, all that is necessary is the exercise of common sense.

It is obvious that the trees in any woodlot are not all of equal value. Some are taller, straighter, thriftier, and of species which yield more valuable wood than others. It is also obvious that there is a constant struggle going on between the trees for light and growing space. The object of thinning is simply to give the best trees the advantage in this struggle by removing the poorer ones which interfere with their development.

First of all defective trees should be removed. This includes trees attacked by insects or fungi(conks), trees with fire-scarred butts, with tops broken off by wind or lightning, and in general all trees which are unthrifty from any cause. Next come the trees of poor form, such as very crooked or very branchy ones, which are interfering with the growth of better formed neighbors. And finally are the trees of less valuable species, such as dogwood, ironwood, and horn-beam. These not only take up space that might better be occupied by such species as oak, hickory, and ash, but also, as a rule, produce seed more abundantly and so reproduce themselves at the expense of more desirable trees.

While the wood removed in these thinnings is frequently of no value for other purposes, it can practically always be used to advantage for fuel. In this way the work can be made to pay for itself, particularly when the future use of the wood ashes for fertilizer is borne in mind. The essential point to remember in making such thinnings is that the woodlot is a tree society, in which the best trees should be given every chance to attain the greatest possible development by the removal and utilization of the unfit.—"American Forestry."

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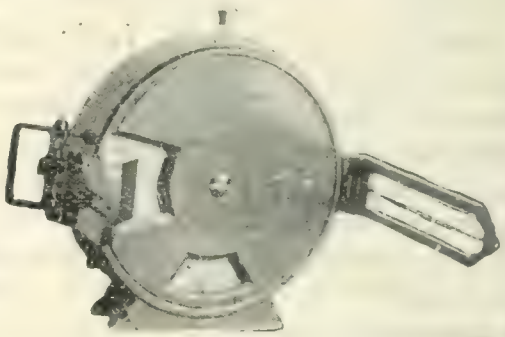

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Canadian Forestry Journal

Vol. XII. January, 1916. No. 1.
(Printed at Kingston, Ont.)

How Canadian Northern Provides Against Forest Fires

Well-Organized System of Collecting Information—Causes and Losses Closely Ascertained—Velocipedes Preferred.

[Editor's note:—Mr. A. E. Warren, Assistant to the General Manager, Canadian Northern Railway, was asked to state for readers of the Canadian Forestry Journal a detailed description of the Company's forest fire protection work. His interesting and complete reply is given herewith. It may be noted that Mr. William Kilby is the officer immediately in charge of fire prevention for the C.N.R. system on its western lines.]

Forest fire protection on the Canadian Northern Western Lines is handled direct from the General Manager's office. All instructions are issued therefrom, and reports are made thereto.

The work on the lines running through forested sections is taken care of largely by special fire patrolmen, whose duty consists essentially in patrolling certain designated beats. Through the courtesy of the Dominion Forestry Branch these men are supplied with badges inscribed: "Dominion Railway Fire Patrol." These badges add dignity to the work, and authorize the men to summon help if necessary. The Company assumes payment for help so summoned, and after two seasons' experience the arrangements in effect have been most satisfactory. The subsidiary forces are comprised of train, section, and bridge crews, telegraph, fence, construction and extra gangs. In cases of extreme urgency all officials and employees of the road are required, as their duty, to assist in the work of fire protection.

Centralizing Information.

In order to cover this work it was first necessary to devise a system of fire reporting which would centralize necessary information. Enclosed herewith are copies of reports in use, together with a chart showing how this information is distributed. It will be noted that everyone employed by the Railway is required to, and means are provided whereby they can, make reports to officials concerned. This is made possible by the use of a special telegraph form so arranged that, with the use of telegraph symbols, essential information can be sent in the shortest worded message and to the proper officials. The action taken on receipt of this information depends, of course, on the nature of the fire. Arrangements are made whereby forest officials are notified when fires occur outside the jurisdiction of the railway company.

All roadmasters and officials above them have in their offices the names, addresses and telephone numbers of special Government Forest officers, and thus no time is lost in summoning their aid should occasion demand.

Every fire, no matter of what size, is followed up by a subsequent report which is submitted directly the fire is extinguished, by the section foreman on whose section the fire has occurred. By this method it is possible to have a complete history of every fire. This is of extreme importance, particularly where damage suits are concerned, and to an almost equal degree for the compilation of statistics. The final disposition of these reports takes the form of a summarized statement for the year showing losses, and other statistics which serve as a valuable record for future handling and guidance.

How Patrols Are Handled.

The fire patrolmen employed on the Canadian Northern Railway are mounted on hand velocipedes. These machines are used in preference to power cars. The reason for this is that up to the present no power car has been found that is really reliable, and, apart from this fact, it has been found that patrolmen when using power cars are more inclined to give their attention to the condition of their car than to fire protection. Using hand velocipedes, these men cover an average beat of 20 miles. It might be said that this is rather long, but it is the opinion that the men passing over their beats daily serve as an object lesson to other employees, and their duty is really more that of fire policemen than fire fighters. Only in the case of small fires are they expected to work and extinguish them.

The fire patrolmen record their activities in a special monthly diary and registration book. These books are placed in special boxes at the end of each patrol beat. Beats are numbered consecutively across each province, starting at the east side of the provincial boundary and numbering westward. The object of this is to eliminate unnecessary correspondence in connection with patrol beats. By this system it is only necessary, if complaint or otherwise is to be made of, say, the first beat east of the Manitoba boundary, to refer to it as Manitoba No. 1. The patrol boxes mentioned are painted red, and there appears on them the following: "C. N. R. Fire Patrol Beat No. ..." The diaries are received in the General Manager's office direct from each fire patrolman, who mails it in a ready addressed envelope, and each man's record is kept separately. At the end of the season a statement showing the time which the man has spent actually patrolling his beat watching for fires and the time spent on other work pertaining to fire protection, is made.

Duties of Patrolmen.

During the season of 1914 (a normal season) it was found that fifty percent. of the men's time was used on actual fire patrol, and the remaining fifty percent. on other fire protection work. The latter consisted of cleaning right of way, cutting brush, filling water barrels on bridges, etc., and cleaning around wooden buildings, culverts, platforms, and other structures liable to destruction by fire. Each man is provided with special equipment, consisting of shovels, water pails, and in some cases a portable telephone set, which he carries on his machine.

Prairie and building fire-protection is also covered.

I might add that the work on the Canadian Northern Railway in this connection has been largely experimental, there being no precedent for handling forest fire protection by any railway along such lines as we now have in effect.

Forestry Talks for Young Folks

A School in the Woods

By James Lawler.

Once upon a time there was a boy. Not the bad boy nor yet the good boy, but just a boy. One morning when he was going to his school he decided he would run away. He thought he would run away from school, but that is where he made a mistake, as you will see.

He ran on and on. He came to the woods and then he ran harder than ever till he began to feel that he must be so far away from school that he would never see it or hear it again. After a while he began to feel hungry and because he could step on his head he knew it must be dinner time. (Not his real head, of course, but on the shadow of his head, as he walked. Did you ever try it to find out if it was near noon?)

He found that it was dinner time, but he did not find the dinner, at least not just then. After he had walked on farther he saw a Jinnee cleverly disguised as a man. He knew he must be one of the Jinn because he had read about them in the "Arabian Nights." This Jinnee asked him where he was going, and being a truthful boy and knowing that it would be useless to try to deceive the Jinnee, he said, "I have run away from school."

"You mean you have run away to school," replied the Jinnee.

"This is the forest," said the boy, "and there are no schools in the forest."

"Did you never hear of a Forest School?" asked the Jinnee. "Come along and you will soon see one."

"This is the forest," said the Boy, "and there are no schools in the forest."

"Here they saw the class of the Forest School. . . . They shared their lunches with the Boy."

"What is it like?"

"It is like a good many things, but out here it looks like a log with a scholar at one end and a teacher at the other." Then the Jinnee added genially, "Have you got your lunch in that bag?"

"I can't eat books," said the boy ruefully.

"Never mind. There is enough in mine."

Then the boy noticed that the Jinee had a lunch box slung over his shoulder by a strap. They walked on a little and the Jinnee began to shout like all Canadian woodsmen, "Hoo-Hoooo," and after a little while they heard a faint reply, "Hoo-Hooo." They went in the direction of the sound and soon came to a little clear space by a brook. Here they saw the class of the Forest School. There were about two dozen young men in the class. Most of them sat on a log and at one end there was a somewhat older man whom they called Dr. Forester. In front of the log there was a small fire over which a black kettle was bubbling.

The Forest Students Have Lunch.

The Jinnee told the others that he had brought a new scholar, whereat one said that he was starting young. However, just then one of the young men said the tea water was boiling and took the black pot off the fire and put in some tea. They then all opened their lunch boxes, for each had one, and brought out a tin cup.

They shared their lunches with the boy and let him drink out of their cups. They had sandwiches of bread and meat and of bread and cheese. Some had bread and butter and jam, and others pieces of pie or very filling cake. Altogether the boy got on famously even if the tea was strong and had no cream in it.

After lunch Dr. Forester drew out a map and laid it on the log, and assigned to the different members the work they should do for the afternoon. Some were to go a mile west and then turn south another mile and "pick up" a survey "blaze" made by the surveyors in 1874. They were then to follow the south boundary line of the township eastward until they reached the next mile stake or "blaze" and they were thus to lay out their work for next day.

Others were to continue "esti-

mating" the timber on the "south forty" which the Boy was told meant a certain square of forty acres. Others were to study Dendrology, which is the natural history of trees. Still others were to chop down such a number of trees of different sizes and measure them.

One thing that struck the Boy particularly was the care they took to extinguish their fire. It was only a little fire to begin with and it seemed all burned out but they soused it with pail after pail of water from the brook till the cinders were swimming in water. That was the way, they said, to keep out forest fires.

In a few minutes they were all at work. The tree-felling was to be done near at hand and the Boy first watched this. The scholars of the Forest School took up their sharp axes, and saws. One cut a nick in one side of a tree with an axe and then two others sawed into the tree from the other side. They soon had

the trees they selected crashing down through the other trees of the forest. Then they took their saws and sawed the trees into logs of different lengths and peeled the bark from these logs. After this they carefully measured the logs and the Boy found that this was done to make the "estimate" more exact, since trees of the same height and the same diameter growing in dif-

"They came up with a party under one of the teachers studying the natural history and characteristics of the trees."

ferent parts of the country contain different amounts of wood.

They Find an Old "Blaze."

When the Boy had watched this for some time, the Jinnee, who was really one of the scholars of the Forest School, said he would catch up with some of the other parties and the Boy stuck to his friend. From the glimpses which he got of the sun the Boy thought they were going north, but the scholar did not go in a straight line, but looked for different things here and there on his journey. He went forward so many paces and looked for a blaze. This showed the Boy that all these woodsmen know how far they step and by scouting their steps can tell how far they travel. In this case they found the "blaze" but it had been made so many years before that the bark had to be taken from a certain part of a big tree to find it. This is one of the difficulties of woods surveying. If the surveyor uses a stake to mark points, the stake rots in the course of years and is lost, and if he uses (as he generally does) a "blaze" on a tree the bark will cover over the wound or "blaze," and then the next surveyor in order to pick up the corned must carefully take the bark from a part of two or three trees, that stand just about the point, in order to find the old mark.

On the way they came up with a party, under one of the teachers, studying dentrology, that is, the natural history and characteristics of the different trees so that at any time of the year they could distinguish one tree from another. In the case of the most common trees this is not difficult, but with those less frequently met with the work requires close attention and study. The Boy counted up how many trees he could surely name.

"This was the Lumber Camp."

Telling the Distances.

Leaving this party they went on again into the forest. The sun went under a cloud and then all direc-

tions looked alike to the Boy. But the Scholar went on and on and a great fear grew up in the Boy's heart that they were lost. The afternoon was drawing on and the latter called out in a sort of singsong the size of the trees within a certain distance of his side of the tape as "pine fifteen; oak, ten; spruce twenty; maple twelve."

"They took their coats off and began to plant little trees about a foot high."

Boy thought with horror of spending the night in a tree with nothing to eat. Just as he was going to mention his fear and ask the Scholar if he thought he could find his way again, that person said, "I guess the boys will be over there by now," and began to shout "Hoo-Hoo-oo." Sure enough, back came the answering shout and after a few minutes brisk walking they came up with four of the men walking straight through the forest. The leader carried a compass and directed his steps by that. In his other hand he trailed a steel tape, the other end of which was in charge of the most rearward man in the party. In this way they knew exactly the direction and the distance they walked. On each side of the tape walked one other man. Each one of these

Tree Measuring.

Then the Boy noticed that the man who had the rearward end of the tape carried a pad of ruled paper on a sort of board and marked down the names and sizes of the trees as the two men called them out. How the tallier could mark down the names and sizes of trees so fast puzzled the Boy and he got out his scribbling book and tried to keep up. He quickly saw he could not write down the name of the tree each time; but even when he had written the names of the trees he could not write the figures to indicate their size fast enough. Then he found that the tallyman's pad had the names of the trees written down one side and opposite these were spaces marked in inches with all the sizes commonly met with in the trees they

"Lamps were lit and the scholars gathered themselves around the tables."

were measuring. When one of the measurers called out a number like "pine twenty-four," the tallyman simply made a dot in the twenty-four inch column opposite the word "pine." At the end of the day these dots are counted and the estimate worked out. The measurers carried wooden instruments called calipers with which they measured the size of the trees when in doubt, but for the most part they trusted to their eyes, as, after a time, they get very skilful in judging the size of trees.

The Boy also found out that in estimating how much timber there was on a certain area, the estimators did not count every tree. They ran straight strips about as wide as a city or town street or country roadway through the property and counted and measured every tree in those strips. Then if the strips altogether amounted to one-twentieth of the whole area, they multiplied the result of their counting by twenty and thus got the timber on the whole area. Of course this must always be done with judgment to make allowance for lakes, swamps, mountains, burnt places or specially good or bad pieces of timber, and here is where the skill and experience of the estimator comes in.

Back at the Log "College."

In spite of his good lunch the Boy began to feel very hungry and he was glad to hear the chief of the party say that they had finished the work for the day and would go back to the College for supper. The Boy thought of the colleges he had seen in the city when his father had taken him there and he was quite surprised, when, after half an hour's walk, they came out on a cleared

space and found only half a dozen log buildings, just like any lumber camp. In fact this was a lumber camp, but the lumbermen, having finished for the season, had gone away.

As soon as they reached camp everybody made haste to wash in water from the lake, dipped up and panned in ten basins set on stumps and stones. This was no sooner over than the cook, in a white cap and a long, white apron, came out of the cook-house and beat with a bar on a steel triangle hanging on a frame outside the door.

At this welcome call to supper all went into the cook-house and seated themselves on benches around long tables.

At the other end of the room was the kitchen where from pots and pans on a big range the cook and his assistant quickly put soup, hot roast beef, potatoes, beans, pudding and pie and tea before the scholars. This was practically the fare on which the shantymen had lived who had left for the season. People who imagine that shantymen live nowadays entirely on salt pork, beans and black molasses have not kept in touch with modern lumbering.

After supper, as the night was somewhat chilly, all the men went into the bunk-house. There was a big stove in the middle of this house and near it a long table. Along the walls on each side were ranged two rows of bunks one above the other like the berths of a sleeping car. The shelves or bunks sloped slightly toward the floor in the centre and all the sleepers slept with their feet toward the stove and their heads to the walls.

Around the Study Lamps.

Lamps were lit and the scholars gathered themselves about the table with the teacher at one end to write up the work of he day. The Boy thought the bunks looked what he called "comfy" and, having found were he was to sleep, he was soon in bed. The last he knew was that the men around the lamps were talking of "altitude" and "dip" and "yield tables," and "township lines" and "east forties."

It seemed that he had just closed his eyes when he was again wide awake because of the most terrifying noise. It must be a fire. The fire brigade must be coming and then he slowly realized that he was not at home but was in the School in the Forest. Then he thought it must be on fire for the noise went on more angrily than ever. It was not yet daylight. There was one lamp on the table and in its light he could see forms moving about drowsily. Men, yawning, hunting for boots, asking for caps, stretching themselves up lazily could be seen all over the row of bunks opposite to him. It did not seem as if they were in a hurry. "Is it a fire?" he asked his bed fellow.

"No, that is the cook ringing the rising bell, and if you want any breakfast you had better get up."

In spite of his hearty supper the Boy felt he could not afford to miss breakfast, so he hurried on his clothes and gave himself a lick-and-a-promise wash in the cold, cold water in the tin basin outside. They had breakfast by lamplight and a very good breakfast it was. There was porridge with syrup, fried bacon, hashed potatoes, good thick bread and butter (both thick), apple sauce, prunes and coffee.

When breakfast was over the men got out their lunch boxes and each man made up a lunch for himself from eatables he selected from another long table where they were all set out for that purpose. They made sandwiches of meat, cheese and jam, helped out sometimes with a boiled egg, a couple of cookies or a piece of pie. The cook thus gets two meals a day, while the scholars are the best judges of what and how much they require for lunch.

Off to the Nursery.

As they were going out the teacher they called Dr. Forester said to the scholar that was the Jinnee, "It's going to be a pretty long tramp to-day. Better bring Jack along with us to the Nursery."

The Boy was inclined to resent this, but still the tramp of the day before had been a long one and he was doubtful about repeating it. But what struck him as strange was that this Dr. Forester should know his name.

The doctor and the Boy and several of the scholars started on a brisk walk, and, after what seemed a good while, the lumbermen's track which the Boy had called the "tote road" ran into what seemed a regular wagon road. A little farther on a telephone line appeared which seemed from that point to strike right into the forest. The Boy who was walking near Dr. Forester called his attention to this.

"Yes," said Dr. Forester, "that line takes a short cut to the camp. It is very handy. I was talking with your father over it last night.

The Boy would have asked more, but just then they came to a little farm in the woods that seemed to be filled with hundreds and thousands and millions of little trees. Some were tiny trees scarcely as thick as a match and only four or five inches high. Then there were long beds as wide as a dining table and miles long, it seemed to the Boy, where the little trees were just peeping through the ground. Farther on there were larger trees and when they reached another field the scholars took off their coats and began to plant little trees about a foot high. The little trees were taken from some of the beds they had passed and were carried about the field in pails of muddy water. What surprised the Boy was the speed with which they were planted. He found that if he walked along the rows slowly two planters working together could about keep pace with him.

The Boy Bids Good-bye.

In a little house in the nursery there was a machine, something like a squirrel cage, which the Boy was told was for separating the seeds from the cones of pines, spruces and other cone-bearing trees.

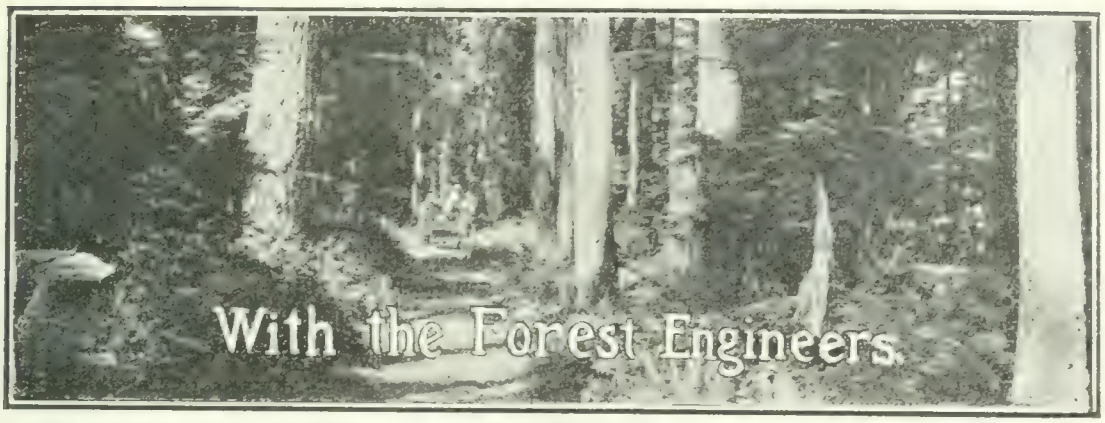
The Boy was examining this and some implements used for planting trees, called dibbles and mattocks, when he heard a familiar sound. It was the jangle of the bell on the light wagon which was used to bring children in from the country to the school which the Boy attended. There were no children at the nursery but the driver stopped at the gate and Dr. Forester said, "I guess this is the carriage to take you to your school." "When you are as tall as this tree," said he taking hold of one eighteen inches higher than Jack's head, "come back to our School in the Forest."

"Thank you," said the boy, "but I shall never be as tall as that tree. It grows faster than I do. But when I am as high as this gate post I will surely come back and learn to be a forester."

And this is how the Boy ran away to school.

Our Biggest Industry

Wall Street Journal: "Measured by number of persons employed, what is the country's biggest manufacturing industry? Lumbering, with its 48,000 saw-mills, its $1,000,000,000 investment in these plants, and its employment of 605,000 men. This does not include, says The Nation's Business, the standing timber, which brings the total investment to $2,500,000,000. This industry furnishes railroads a traffic income of $200,000,000 a year. Yet lumbering is one of the most depressed of industries, and seems to be the victim of its own helplessness because of uncontrolled competition.



(Published in Collaboration with Canadian Society of Forest Engineers.)

One-Third of B. C. Forest Staff Enlists

Ever since war broke out members of the Forest Service have been leaving on furlough for the bigger job overseas, and they are still doing so. Out of the regular or permanent staff, which in the summer of 1914 before the war numbered about 170 (including female clerks and stenographers), almost one-third have enlisted to date. In addition over 20 members of the temporary or summer staff of guards, patrolmen, etc., are known to have enlisted, and it is very probable that as many more have joined of whom no information is now available. The recent enlistments are as follows:—

A. H. Black, Cruiser, Victoria—Engineers, Vancouver.

Jack Thompson, Ranger, Tete Jaune—Pioneers, Victoria.

O. J. Sangar, Forest Assistant, Lillooet—Artillery, Victoria.

W. Ross Flumerfelt, Forest Assistant, Vancouver — Engineers, Vancouver.

E. F. Heath, Ranger, Fort George—67th Western Scots, Infantry, Victoria.

R. Jobson, Guard, Fort George—67th Western Scots, Infantry, Victoria.

J. J. Donnelly, Guard, Fort George—67th Western Scots, Infantry, Victoria.

N. F. Murray, Guard, Fort George—67th Western Scots, Infantry, Victoria.

R. L. Condy, Clerk, Fort George—67th Western Scots, Infantry, Victoria.

J. R. Chamberlin, Forest Assistant, Victoria—Royal Flying Corps, England.

Clarence Ferris, Messenger, Victoria—103rd Battalion, Victoria.

H. S. Laughlin, Forest Assistant, Victoria—Captain, 104th Battalion, New Brunswick.

G. R. A. Ball, Clerk, Victoria—88th Battalion, Victoria.

G. H. Llewellyn, Draughtsman, Victoria—Sergeant, 5th Regiment, Victoria.

C. I. McKenzie, Draughtsman, Victoria—Captain, 88th Battalion, Victoria.

Mr. P. Z. Caverhill, Deputy District Forester in the Vancouver Forest District, has accepted the position of Chief Forester for New Brunswick. Mr. Caverhill is a native of that Province, a graduate of the University of New Brunswick, and has had a wide experience and been a valued officer both in the Dominion and British Columbia Forest Services. His many friends will wish him every success in his new work.

FOREST FIRE STATION ON MOUNT HOOD

During the summer of 1915 an innovation in the work of fighting fires in the national forests was brought about by the installation of a fire observatory on the summit of Mt. Hood, one of the five highest mountains of the Pacific Northwest. Mt. Hood stands 11,225 ft. above sea level, and even in midsummer the weather conditions at the summit are at most times severe. The establishment of the station was largely an experiment on the part of the U. S. government, there having been a great deal of doubt before the experiment was tried as to whether an observer could stand, for an entire season, the lonely existence, the high altitude, and the storms. This point was conclusively settled by a mountain guide whom the government employed as an observer. This guide, who had already made 350 ascents of the mountain, succeeded in establishing a camp on the summit and spent the entire summer there in comparative comfort. So successful did the experiment prove that toward the end of the season the government built a wooden observatory building on the summit. This building will serve as permanent quarters for the Forest Service, and in addition to this, will be used as an observatory for the United States Weather Bureau. As a result of the satisfactory outcome of the experiment, plans have also been made for the installation during the year 1916 of a number of other snow-peak observatories.

When it came to establishing the fire observatory on the summit of Mt. Hood, the work of getting the necessary equipment and supplies to the top proved to be a big undertaking. Above the 6,000-ft. level the mountain is continually covered with snow, while the slopes are so steep and treacherous as to tax the resources of the most skillful mountain climber. There are two routes to the summit, one up the south side of the mountain and the other up the northeast side. Just below the summit, on each of the routes, where the slopes are particularly steep and perilous, a steel cable has been anchored to the mountain side, and it is only with this that the climb can be made with any degree of safety. The cable on the south route is 800 ft. long, and that on the northeast route, 1,800 ft. long. The 4,000 lb. of material required for the camp was taken up the south route. Pack mules were used for transporting it up the mountain side and across 2½ miles of the snow zone to the 8,000-ft. level. From this point the climb was too steep and dangerous for this mode of transportation, and the material was carried the remainder of the way to the summit on the backs of the observer and an assistant. At the summit there is a scant two acres of fairly level snow-covered ground with little in the way of mounds or depressions to furnish shelter. Even in midsummer the temperature sometimes drops nearly to zero. To resist the high winds, the tent, 12 ft. square, was not only securely guyed but was heavily weighted around the sides. It was provided with a double floor. A comfortable bed of Hudson Bay blankets and a sleeping bag, a liberal stock of food, instruments for making observations, and a few books, constituted the living and working equipment of the observer. With the pioneer work done, the transporting of material for the permanent wooden building at the summit was carried out with less uncertainty and danger.

The Journal is indebted to "Popular Mechanics Magazine" for the cuts appearing on opposite page as for the text of the description.

Party of Mountain Climbers Working Their Way to Summit with Aid of Cable

One of the two Observation Stations on the Summit of Mount Hood, from Which the Forests for Hundreds of Miles in Every Direction are Watched Constantly. When a Fire is Discovered a Sight is Taken with the Instrument Mounted on the Top of the Post and the Bearing is Telephoned Immediately to the Supervisor's Office.

Cable and Telephone Line Spanning a Large and Dangerous Crevasse

Extending Telephone Line to 9,000-Foot Level

How the Telephone Line was Carried to Summit

This Tent, in Which the Fire Observer Lived during His Long Watch on the Summit, Is the First Habitation Ever Maintained on a Snow Peak in the United States.

Forest Problems in the Okanagan Valley of B.C.

By Geo. P. Melrose,
District Forester, Vernon, B.C., under Forest Branch of the Government of British Columbia.

In a country where agriculture is the leading industry and where wood is plentiful and easy of access, it is difficult to interest the majority of the population in forest protection. This is even more the case when the lumber and other forest products used can be brought into the district about as cheaply as they can be procured on the ground. It is hard to interest the general public in anything that does not affect their pocket book or their comfort.

In the Okanagan Valley were we to depend upon the influence of the lumber trade to awaken interest in forest protection, we should probably have a great many years of hard sledding. Although there are some 10,000 M feet of lumber cut every year in the Okanagan, the amount is insignificant as compared with the tremendous quantities cut on the coast. The amount of money distributed through the lumber trade is small compared with that distributed through agriculture. The Valley is essentially a fruit and vegetable raising district.

Lying as it does in the "Dry Belt" the annual precipitation is not sufficient to water and nourish the large acreage of orchards and crops. Irrigation is resorted to to such an extent that already several millions of dollars have been invested in irrigation works, while only about 35% of the available agricultural land has been taken up.

The irrigation systems naturally depend upon the stream flow. A reliable system of irrigation works must have a constant and steady flow of water from the supply streams. Even costly dams will not entirely make up for an irregular and non-dependable stream flow, and the regularity of the stream depends almost entirely upon the maintenance of a proper forest cover.

Through the irrigation systems the people of the Okanagan must be appealed to, in order to protect the forests, conserve the water supply, and the timber for the future, and thus insure the continuing prosperity of the district.

A Distinctive District.

This article will deal entirely with the Okanagan Valley, or that greater portion of it that lies within the Vernon Forest District. No attempt will be made to describe the forest cover or the forest protection of the remainder of the Vernon district, which has to a greater or less extent, an entirely different climate, forest cover or administrative problem.

What is commonly called the Okanagan Valley in Canada, extends from Armstrong, about twenty-five miles south of the main line of the C.P.R. to the international boundary. The main valley runs practically north and south with few side valleys of any great importance. Okanagan Lake occupies the floor of the valley for about 90 miles of its length, while a chain

Sawmill operation in Yellow Pine, Okanagan Valley, B.C.

of smaller lakes run south to the International Boundary, the probability being that the lake was once continuous from north of Vernon to somewhere on the U. S. side of the line.

From the level of the Okanagan Lake, which is 1,175 feet above sea level, the mountains surrounding the Okanagan watershed rise only about 7,000 feet at the most. By far the largest number are from 3,000 to 4,000 feet high, and lie far back from the main valley.

Low rolling hills surround the valley, broken by deep gulches, and a few valleys, which widen out some distance back. These hills gradually rise, as they recede from the valley, to the plateau and mountain country of the watershed summits.

Plateau country is the predominant feature of the Okanagan watershed. Plateaux with low smooth hills and shallow lakes, many swamps and streams. Their continuity is broken by regions of high mountains and deep gulches, with swift streams and craggy outcrops of country rock.

Fruit-growing Soil.

Though there is not a great deal of outcrop throughout the valley the soil is not deep. It consists, except on the benches near the lake, of loose gravelly and sandy loam with a great deal of granite wash and loose rocks and boulders. The benches are composed of a light grey-colored gumbo clay, known locally as volcanic ash though it is not known whether there in any authority for the same. This material extends to great depths and is excellent for fruit raising.

In the Vernon and Armstrong districts the soil is a deep dark loam.

The climate in the Okanagan is remarkable for the latitude and the elevation above sea level. The summers are long and hot with little rain. The winters are short and mild. In the southern end of the valley there is never sufficient snow for sleighing, near the level of the lake, except in exceptional seasons. Higher up in the hills the winters are hard and long. By the first of March the sun's heat is felt, and the snow melts off at the lower levels. The middle and end of April often see a serious fire season commencing. Warm weather lasts till the end of October, although the nights, always cool, get cold and frosty. Snow usually appears on the high peaks about the middle of October.

Four Forest Types.

In describing the forest in this district, it is necessary to describe only four main types. These are determined by altitudinal and moisture conditions.

Yellow Pine Type.—On the lower slopes up to an elevation of approximately 3,000 feet, forming a very distinct belt around the centre valley is the yellow pine type. It is composed of Western Yellow Pine (Pinus Ponderosa) and Douglas Fir (Pseudotsuga Toxitolia) with Yellow Pine predominating. Both these species are intolerant of shade, the Yellow Pine being exceedingly so, and produce an open stand.

The annual precipitation in this belt is less than 20 inches, producing a condition of extreme drought in the summer months. This accounts for the presence of the Yellow Pine, and the poor character of the Fir in the type.

The average stand of merchantable timber in this type in the Okanagan is between 3 and 4 thousand board feet per acre, although in some specially favored localities it has been cruised as high as 10 thousand. A large percentage of the type however does not produce merchantable timber and is suitable for nothing but stock range and the production of cord wood.

An abundant growth of Pine grass covers the forest floor and affords grazing to cattle and horses. This, however, early ripens, and becoming dry and inflammable adds a large factor of danger to the general fire hazard. Fires in this type have not a very great disturbing effect, but as they occur time after time over the same area, large loss occurs through the enlarging of butt scars and the destruction of seedling and second growth.

There is probably from 25% to 50% of this type occupying land that will eventually be used for agriculture. This land produces the best stands of Yellow Pine, and therefore the amount of this class of timber is likely to be reduced in the very near future, as agriculture develops.

The Fir Type.

Above, and bordering on the Yellow Pine type we have the Fir type. On the lower hills, that is up to 3,000 feet, it is often hard to distinguish between the Fir and the Yellow Pine types, but with a little increase in the elevation, the Yellow Pine quickly thins out, and Fire becomes predominant.

This type forms a belt above the Yellow Pine type, from the elevations of 2,500 feet to 4,000 feet. The precipitation at this altitude is somewhat higher than in the Yellow Pine type and this accounts for the frequent presence of Tamarack, Spruce, Cedar and Lodgepole Pine.

This is a permanent type. Reproduction in openings caused by either cutting or firing, is sure and abundant. The percentage of Fir is temporarily reduced after fire, Lodgepole Pine taking its place. As Fir is intolerant of shade, it cannot compete with the more tolerant Lodgepole Pine until openings occur. Tamarack and Spruce reproduction is not affected so greatly by the action of fire.

The Spruce type occupies the watersheds and plateau regions of the district between the elevations of 3,500 and 7,000 feet. High moisture content of the soil is necessary and abundant precipitation. The species found in mixture are Spruce, Lodgepole Pine, Alpine Fir, and Douglas Fir. The species, except Douglas Fir, are all tolerant of shade, and reproduce abundantly, when moisture conditions are not disturbed.

Fire Reduces Spruce and Fir.

As the Spruce and Alpine Fir are easily killed by fire and fire also has a disturbing effect on soil conditions, the type disappears after fire and is replaced by the Lodgepole Pine type. At one time probably 25% to

30% of the district was under this type, but, owing to fires the percentage has dropped to from 10% to 15%.

The amount of commercial timber in the Spruce type is small, the forest being almost entirely a production forest. It is permanent if not disturbed by fire.

Lodgepole Type.—This type occupies the areas of higher elevations, plateaux and mountain sides from 3,000 feet to 5,500 feet. It covers probably 20% of the area of the district, and is gradually widening, due to repeated fires, at the expense of the Spruce and Fir types.

The type is composed of Lodgepole Pine, Alpine Fir, and Aspen with a mixture on the lower levels of Fir and sometimes Yellow Pine. Better moisture conditions are required than in the Fir types, though less than in the Spruce.

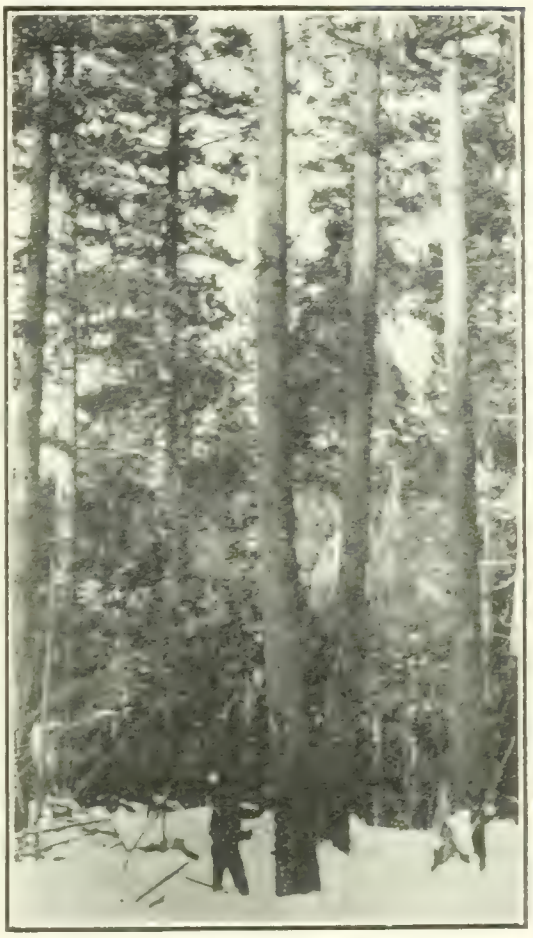
Reproduction after fire is abundant and sure, until about the fourth and fifth burn when a barren is created. The second growth is often so dense, that reproduction is poor though in the more open stands Spruce and Douglas Fir reproduction is well represented. As these latter species are longer lived than the Lodgepole Pine, and originally occupied the sites where Lodgepole Pine is now predominant, it is probable, that given time the Lodgepole Pine will be replaced to a large extent, by the original stands of Fir and Spruce.

The type is at present occupying entire watersheds. The stand averages somewhat less than 2,000 feet per acre, and therefore we must classify the type as mainly a protection forest.

There are, of course, several other types in the district, but these are of very little importance commercially or for protection of the watersheds.

Relative Importance.

In discussing the importance of these four types they naturally divide themselves into two groups of two each, viz.: Under commercial forests, the Yellow Pine and Fir types and under Protection Forests, the Spruce and Lodgepole Pine types.



Fir stand, Okanagan Valley.

The former contain practically the entire stand of commercial timber in the District, amounting to some 1,584,187 M feet board measure, distributed over an area of 521,200 acres.

The non-commercial or Protection Forests in the Okanagan cover approximately 1,374,300 acres and have a total stand of nearly 2,078,000 M. feet board measure. Of this large area of non-commercial forest land, providing proper protection from fire we can expect that 25% to 50% will eventually turn into commercial forest through the return of the permanent Fir and Spruce types, and the present stand of Spruce through a longer lease of life will yield a large per cent. of commercial timber.

Users of the Forest.

(a) Lumber Trade.—The lumber industry is not the most important user of the forest in the Okanagan, or better perhaps, the income from the lumber trade is not so great as that from other activities dependent on the forests.

The annual cut of the district is probably about 10,000 M. feet board measure, which represents a total value of $250,000 to $300,000. A very large percentage of this cut is used in the manufacture of fruit and vegetable boxes, and is, therefore, through this branch of business dependent upon the forest from another aspect, rather than their capacity to produce timber.

In the Okanagan Valley there are now operating six saw mills with a total daily capacity of probably 225 M. per day. For several years, however, they have not been working full time and the annual cut has been low. At the time of writing, however, the outlook seems to be brighter, and several large orders have been headed towards the local mills.

A very important part of the industry, as has been mentioned is the manufacture of boxes and crates for fruit and vegetables. There are about 400,000 boxes and crates used in the Okanagan in 1915 calling for some 1,500 M. to 2,000 M. feet of lumber.

Other products besides lumber, are railway ties, construction timber, poles and mine props.

The local market takes most of the product, but owing, no doubt, to the splendid campaign being carried on in the prairies for the use of B. C. wood, a wider market seems to be opening out. Several orders have already been received from the prairies, and it is expected that there will be a profitable trade established in the near future.

Better Times in Sight.

The lumber interests have been going through a very critical period, but better times are in sight, and the future will probably see a fairly large lumber business carried on, up and down the Okanagan Valley. With increased acreage under agriculture, increased output of fruit and vegetables, and increase in population, there will be need for more flume stock, lumber for houses, barns, etc., and a tremendous quantity for boxes and crates. The outlook is bright, and the lumbermen are ready to grasp any opportunity that offers to further their business and incidentally the prosperity of the entire district.

The Water Supply.

The Okanagan district is famous for its fruit and vegetables. It is essentially an agricultural district and annually produces a crop of fruit and vegetables valued at over $2,000,000.

Owing to the scarcity of rainfall the whole district is dependent upon irrigation for the success of its crops. There are approximately 900,000 acres of watershed tapped for irri-

Scaling Western Yellow Pine logs. Note contrast between heart and sapwood.

gation, power and domestic users. This represents an actual investment of capital of many millions of dollars. Irrigation flumes and ditches, power plants, city water systems, all represent a large investment and all are dependent upon the maintenance of a good forest cover on the watersheds to supply streams fod their continued usefulness.

An idea of the amount involved can be had by capitalizing at 5% interest, the annual income from agriculture, which so dependent upon irrigation. The total annual value, we said, was $2,000,000. At 5% the capital value of this would be $40,000,000. This much money is not actually invested in irrigation projects but it is invested in farms, fruit trees, homes, etc., which are all dependent upon the continuance of the water supply and which all contribute to the earning of the annual income of $2,000,000 or more. Therefore, I think it is fair to say that the forest cover on the watersheds of the Okanagan represent a total value of $40,000,000 or more for irrigation alone.

If the value of the water supply to the cities and towns, power plants and private individuals is also figured the amount involved would reach a tremendous sum.

Forest Protection.

The immediate problems thus confronting the Forest Branch in the Okanagan are mainly protective. The highly inflammable state of the majority of the watersheds, and their importance, make it imperative that great care be taken to keep fire out. Fire hazard in other localities in not excessive and the danger resulting not so large; they need, therefore, less attention.

Happily we are blessed with an excellent system of roads and trails, thus facilitating communication and guaranteeing quick access to fires. So far, however, full advantage has not been taken of this system, in the matter of suitable conveyances, but we are now coming to a stage in our development where we can advance no further till the best means of transportation on the roads, automobiles, are used.

(a) Prevention.—Since the Forest Act was passed in 1912, an active campaign has been carried on for care with fires, through the agency of posters, whetstones with suitable inscriptions, newspaper articles, slides for motion picture theatres, etc. Personal appeal by the Forest Officers has also played a large part in the propaganda.

The permit system as administered in B. C. is one of the best means of keeping down the fires, and results in the Okanagan have been entirely satisfactory. By this system we not only have all slash burnings examined by Forest Officers but the Officers come in contact with the largest proportion of the forest users, and have an excellent chance to put forward the cause of forest protection.

In the endeavor to enlist all parties in our work co-operation has been arranged with railway employees, stage drivers, logging and saw mill foremen, mine managers and superintendents, telephone companies, storekeepers, and many private individuals who have a chance to aid. Besides these an agreement has been drawn up between the Dominion Service in the Railway Belt and the Provincial Service, covering fires burning near the boundaries of their respective districts. On the south the officers of the U. S. Forest Service have signified their willingness to co-operate along the international line, and, next year, I believe, will see the beginning of a working agreement with them.

Lookout Stations.

(b) Detection.—So far the Okanagan has been fairly well supplied with detection facilities. The two most important watersheds, viz.: Vernon and Kelowna are provided with lookout stations with telephone

connections to the towns named. These stations have been in actual use only one full season; that of 1914. The 1915 season was not hazardous enough to warrant putting lookout men on duty. In 1914, however, they showed clearly the advantage of their positions. Although in the worst part of the season they were rendered useless by smoke in the valleys, yet during the preceding period many fires were located and quickly attacked, that would probably have cost several times the value of the lookout station, had they not been discovered so quickly.

It is planned to continue this system and add other stations from time to time. With three more lookout stations we shall have practically every acre of watershed and merchantable timber in the valley directly under the view of forest officers in the danger season.

(c) Control.—The control problem is one of the great moment, and we are still in the experimental stage as to the best method of attacking fires in certain types, best implements to be used and the best means of transportation, as well as many other problems.

Owing to the inflammability of the ground cover and the forest itself in most types, fires assume large proportions in a very short time. Quick arrival at the fires is therefore essential, and here it is we can take advantage of our excellent road system. Were it not for the roads I believe that practically the entire area of range would be burned over every year. As it is, guards arrive quickly at range fires, usually near towns, and get them under control without delay.

The somewhat slower rate of spread where the timber is thicker, allows of more time, which is necessary, as the roads are not so plentiful nor so conveniently located. As settlements advance more roads will be built, until practically the entire hazardous area of the district will be within easy reach of a road. Then with automobiles, for the transportation of men, tools, and supplies, we shall have our communication problem solved.

State of Organization.

The control force at present in the valley consists of the District Forester, one Ranger, and six temporary, 4½ months, guards, with provision for an increase of short term patrolmen and special patrolmen hired by the day as the season advances. Day laborers are hired as they are needed for actual fire fighting.

This plan of organization allows of great flexibility. As the hazard increases or decreases, so men are put on or laid off. The only defect is the difficulty of procuring the same men each year for short terms of employment. If some way can be devised to keep these men always on hand a great step forward will be taken and the efficiency of the force advanced at least fifty per cent.

Since the Forest Branch has established in 1912 there have been only three fire seasons. It can hardly be said, therefore, that a permanent organization has been created. Permanent would seem to presume a long term of service as a stable unit. It will take a great many years' experience to determine just what permanent force is most suitable to cover all conditions and serve as a skeleton for the temporary increases made necessary by increased hazards.

Each year, however, we come a little nearer, each fall we are able to check up the past season's work and see a little progress, and each spring correct in our organizations the mistakes and shortcomings of the previous year.

The Lesson of Experience.

The summer of 1913 was wet, and the hazard was slight. The damage resulting from forest fires therefore

was negligable; 1914, however, proved one of the worst experienced in years. It was likened by many to the famous bad year of 1910. The force being new and in many cases inexperienced, though doing all that could be expected, was not sufficient to cope with the situation. No similar years had confronted the new organization and consequently provision had not been made to look after such a bad situation.

In 1914 there were 198 fires, burning a total area of 88,400 acres, and damaging property valued at $28,000.00.

The past season, 1915, proved to be very favorable and the damage was slight. The number of fires was 72 with only 14 of them costing money to fight, against 97 in 1914, or 19 per cent. against 49 per cent.

These results would show an improvement over 1914. In both years there has not been a serious fire on or threatening any of the important watersheds. The experience of the two preceding years enabled us to place an organization, and so distribute it that the percentage of fires costing extra money to fight was reduced by 30 per cent. The percentage of fires of unknown origin was also reduced showing a better distribution of the force for detection. The lessons learned in 1914 were put to good purpose in 1915. Those of 1915 will be put to good purpose in 1916.

Ideal conditions will never be reached, as ideals never should, but each year will see a better and more efficient organization, and consequently decreased danger to the valuable watersheds and timber supplies of the Okanagan.

Double Reason for Care.

Lack of space has prevented the presentation of a great many facts and figures concerning the forests and the problems confronting the Forest Branch in the Okanagan Valley but enough has been said to show that the main problem is and always will be one of protection. Protection, not so much for the intrinsic value of the timber involved but protection for the maintenance of a steady and reliable supply of water for irrigation, and through that, protection to the great agricultural interests that make for the prosperity and advancement of the entire district.

Douglas Fir Wins in Test

Victoria, B.C.: Two Douglas Fir and two Red Cedar railway ties were recently forwarded by the Forest Branch of the Department of Lands, to the Great Eastern Railway Company of England, who selected two sleepers from their stock which they obtained from the Baltic, and tested them all under similar conditions.

The results of these tests show beyond a doubt the superiority of British Columbia Douglas Fir for railroad ties.

It was found that under compression Douglas Fir will stand 5,695 pounds per square inch; while Red Cedar made a very creditable showing against the Baltic timber of 3,407 pounds per square inch.

Tests in tension were even more favorable for Douglas Fir. This is shown by the fact that it would take 11,450 pounds or over 5½ tons to pull apart a stick of Douglas Fir having a cross section of one square inch; whereas just half that weight would suffice to pull apart Baltic timber, and only 3,300 pounds were required to separate Cedar.

These tests were carried out by the Great Eastern Railway, and the results which they found will be of immense value to the reputation of Douglas Fir as a railway tie material amongst English engineers. The importance of this is increased by the fact that English engineers have the supervision of most of the railway lines in China, India and South Africa, all of which are valuable markets for Douglas Fir.

Recommendations for Quebec

"Summing up in brief the general situation of forest protection in the Province of Quebec, we would recommend, first, of all, furthering the formation of the limit holders into co-operative associations: secondly, increased appropriations from the Provincial Government and co-operative interests for permanent improvements. Lookout stations carefully located and coupled with telephone communication furnish probably the best assistance to prevent fires getting out of control; and thirdly, that the laws pertaining to forest protection be amended to more restrictive relation towards offenders. I am pleased to report that the Honourable the Minister of Lands and Forests is considering proposed amendments, and we feel that the necessary changes will be made and put in force for the coming season."—Arthur H. Graham, Chief Fire Inspector, Lower Ottawa Forest Protective Association.

At the request of the Editor of the Journal, Mr. Arthur H. Graham, Manager of the Lower Ottawa Forest Protective Association, prepared the following statement summarizing the results in his 1915 operations. The attention of readers is directed particularly to the comments upon the reduction in settlers' fires through prosecutions.

"We have this season increased our area by 944,640 acres and have now the patrolment of 8,504,320 acres. Within the above area there remains but one or two small limit holders who are not members of this Association. The figures as given do not include lots taken up by settlers or other holdings taken out of the limits.

Rangers and Equipment.

Organization.—The total area was divided into four divisions and 49 ranger districts. The patrolling was done with 58 rangers and 4 inspectors (or Chief Rangers). All rangers were equipped with canvas water buckets and fire fighting equipment was stored at convenient places in their districts. The patrolling was done partly on foot, canoe, or with horses. The nature of the district trails and roads being taken into consideration. 10,000 fire posters were used in placarding roads, trails, camping grounds, watering places, etc., and a large quantity of warning pamphlets were distributed among settlers located in vicinities bordering the limits.

During wet periods rangers were kept busy trail cutting, building fire places, lookout towers and ranger camps and construction of telephone lines. Two hundred and twenty miles of trail were cut and cleared this season.

Causes of Fires.

Fires.—155 fires were extinguished this season and of that number 113 were extinguished without extra labor, or in other words, put out before spreading. They originated as follows:—

Settlers	79
Fishermen	15
Berry Pickers	8
Squatters	8
Lightning	6
Drivers	4
Hunters	4
Woodsmen	2
Indians	2
Railways	2
Surveyors	1
Unknown	24

Settlers' Fires.—The above figures show that 51% of all fires originated from settlers. This is a considerable decrease over the per-

centage of fires from that source last year. Our rangers supervised the burning of 322 slashes and permits given.

With the co-operation of the Provincial Government we continued to prosecute settlers in the same manner as in the season of 1914 and convictions were secured in 40 cases and it may be said that very few of the number were found in the vicinities where prosecutions took place last year.

Getting After Malefactors.

Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association, with headquarters at Three Rivers, P.Q., gave the Journal the following condensation of prosecutions undertaken by him during 1915:

Charles Larouche, was prosecuted by the Association, for having set fire to the forest on May the 31st, 1915, near the town of La Tuque. He pleaded not guilty and was placed on trial at Three Rivers before Magistrate Marchildon. The judgment was pronounced against us.

Francis Morin, of St. Ignace du Lac, was prosecuted by the Association, for having set fire to his slash during the prohibited season without first obtaining a written permit from the ranger. He was placed on trial at Three Rivers before Magistrate Marchildon and pleaded guilty. He was condemned to pay a fine of $10 and in default of payment of fine and costs one month imprisonment. He passed one month in the common jail at Three Rivers. Fine, $10.00; costs, $44.50.

Albert Beaulieu, of St. Ignace du Lac, was prosecuted by the Association for the same offence. He pleaded guilty before Magistrate Marchildon at Three Rivers, and condemned to pay a fine of $10.00, plus costs, and in default of payment he was to spent one month in jail. The high constable has twice gone up to get this man but was unsuccessful each time. He has not paid his fine and is still at large. We will get him in the spring. Fine, $10.00; costs, $44.50.

Joachim Savoie, of St. Charles de Mandeville, was prosecuted by the Association on identical grounds. He pleaded guilty before Magistrate Lacroix at Joliette and was condemned to pay a fine of $1.00, plus costs, the costs amounting to $3.70. He paid his fine.

Arsene Bellerose, of St. Michel des Saints, was prosecuted by the Association for burning without permit. He pleaded guilty before Magistrate Lacroix at Joliette and was condemned to pay a fine of $1.00, plus costs, the costs amounting to $2.00. He paid his fine.

Leonard Charrette, of Notre Dame de la Merci, was also prosecuted. He pleaded guilty before Magistrate Lacroix at Joliette and was condemned to pay a fine of $1, plus costs, the costs amounted to $27.35. He paid his fine.

Alvini Beauchamp, of St. Donat, was acquitted before Magistrate Lacroix at Joliette, as several witnesses seemed more inclined to favor the accused.

Charles Crepeau, of Notre de la Merci, was acquitted by Magistrate Lacroix at Joliette. Witnesses seemed more inclined to favor the accused.

Damien Desroches, of St. Damien, was prosecuted by the Association for having set fire in the forest to obtain work in fighting same. He was condemned before Magistrate

"For Valor"

"It is my belief, and I venture to assert it," declared the lecturer, raising his voice, "that there isn't a man in this audience who has ever done anything to prevent the destruction of our vast forests." A rather timid-looking man quietly arose in the rear of the hall and said: "I-er--I've shot woodpeckers."

Lacroix at Joliette to pay a fine of $10.00, plus costs, and in default of payment to imprisonment in the county jail for one month. He spent his one month in jail. Fine $10.00; costs, $45.15.

Joseph Rivest, of St. Come, was prosecuted by the Association for having set fire to his slash during the prohibited season without first obtaining a written permit from the ranger. He was acquitted by Magistrate Lacroix at Joliette, as the witnesses favored the accused.

Ernest Bouchard, Louis Guerin, Doe Hervey, Philippe Claveau, Philippe Brassard, David Tremblay fils de Jimmy, Durgene Ellefson and Mederic Tremblay were prosecuted by the Association for having set fire to the forest while working on the improvements. Their attorney has since taken an injunction against the proceedings claiming that we had no rights to arrest them in the manner that we did. The injunction has not yet come before the judge.

Where Skilled Management Pays High Dividends

A Swiss Canton in 30 Years has Tripled the Annual Forest Cut Without Decreasing Capital Stock.

It would be easy to show that several forest managers have reached the point of realizing a return which is greater than is the amount of the expense of administration solely by judicious management and intelligent sale of the products of their forest. As an example of this let us take the Commune of Couvet, Canton de Neuchatel, Switzerland. The forests of Couvet have a total area of 345 acres. They have been managed for thirty years by a technical forester. According to the plan of improvement and the control of operations we see by the table on the opposite page the development of the standing material and the production both in material and in money.

From 1883 to 1913 the annual cut has increased from 42.36 cubic feet per acre to 128.49. It has thus tripled and that has been obtained without a diminution of the standing material. The latter has even slightly increased. It is necessary to note also that the proportion of larger timber, the most valuable, which in 1883 was only 18% is now 30%. The proportion of wood for manufacture in the annual cut also has increased from 56% to 69%. As to the return in money it has nearly doubled. The credit of such good result is due in the first place to the method of direct management which the Canton of Neuchatel has provided. Applied elsewhere in the same conditions there is reason to believe that it would not have less good results. Examples of it are abundant.

RESULTS OF THE OPERATIONS OF THE COMMUNAL FORESTS OF COUVET FOR THE PERIOD FROM 1883 TO 1913.

Forested Area, 345 Acres.

Year	STANDING TIMBER.				Estimated Production per acre from the main stand Big Timber Cubic Feet	Actual Cut per acre Big Timber Cubic Feet.	Proportion cut building timber by percentage of principal cut.	Production in money per acre. Gross.
	Large Timber per acre. Cubic Feet.	By Sizes in Percentages.						
		Small (8 to 13.9 inches.	Medium. (14 to 24 inches.	Large. (24 inches upward.				
1883								
1890	4236	32.8	49.3	17.9	35.3	42.36	....	.....
1895	4264.24	30.5	49.3	20.2	73.42	105.9	55.8	$ 9.36
1901	4306.6	27.7	50.3	22.0	86.13	103.07	58.9	12.24
1907	4306.6	24.8	49.1	26.1	101.66	114.37	64.8	13.68
1913	4405.44	21.5	48.4	30.1	105.9	128.49	68.5	16.88
					127.08			

Managing A Forest Reserve

A Description of the Varied Problems Confronted in Saskatchewan —How the Reserves Help Their Neighborhoods.

By Everett H. Roberts,

Acting District Inspector of Forest Reserves, Prince Albert, Sask.

Saskatchewan is the keystone province of the West and to the casual observer this signifies a wheat producing country with vast expanses of treeless prairie and to any traveller who crosses her fertile lands on any of the three main lines of railway, his deductions would not be far wrong if he had only to depend on what he sees from the observation platform. But let his vision expand in this western atmosphere and enquire more fully into the matter and he will find that at present only about one-third of the total land area of this province is open country and treeless, except along the river banks perchance a few scrubs may be found. Roughly speaking, another one-third is forested area which fosters the next greatest industry of the province outside of wheat raising, namely, as you proceed northward mixed farming, cattle raising and the timber business. The remaining third is for the most part waste land at the north of the province which runs through miles of muskeg and lake country into the barren.

The central third or forested portion is that to which I wish to give most of my attention, as at the present time it is undergoing the most rapid development. This area, roughly speaking, lies north of the main line of the Canadian Northern Railway and south of the Churchill River and contains most of the larger Forest Reserves in the Province. A very small percentage of this area is really adapted for agriculture and the government has withdrawn vast areas of this portion and put it into Forest Reserves with the object of preventing ignorant settlers from taking up worthless land which might give them a couple of crops after considerable expense in clearing it up, and further to protect what remaining bodies of merchantable timber have escaped the devastating fires that have swept this north country for centuries. Much of this land now contains thousands of acres of young vigorous forest growth which with protection will in time furnish the people of the province with lumber and fuel, when the present virgin stands have disappeared.

Fifteen Forest Reserves.

The government by a very wise policy has set aside for forest purposes fifteen Forest Reserves with a total area of approximately six million acres. These are divided into two classes, those in the north country which are essentially forest land, and those on the prairie which are usually sand hills or badly broken grazing country. It is the intention to eventually plant up these prairie reserves and thus aid in retaining moisture and affording shelter; and further, to provide some fuel and fence posts for the settlers. These areas are practically barren

at present with only a very scant covering of grass and in places the sand has commenced to drift very badly. The object of the larger reserves is to afford protection for the remaining merchantable timber that exists, also for the vast areas of young forest coming up. These big reserves are essentially forest land and not adapted under present conditions for agriculture, though there are numerous other uses to which they are being put under the administration of the Forestry Branch.

There will continue to be an increasing demand in the country for lumber which these reserves will eventually supply as well as fuel and fence posts which are in constant demand by the farmers.

During the past summer the Dominion Forestry Branch had about fifty fire rangers on duty patrolling this vast expanse of wooded country outside of the Forest Reserves. Travel was by foot, canoe, saddle horse and motor boat depending on the locality the ranger was in, it being his duty to be on the lookout for fires and put them out whenever found, to warn settlers and travellers about the danger of fire, and to keep trails and roads open so as to make the districts accessible.

Towers and Fireguards.

Besides these fire rangers who are employed only for the summer there are about forty forest rangers on the Forest Reserves who are employed the year around, their chief duties in summer being fire protection, supervision of the cutting of hay and grazing, also game protection. In winter the supervision of the wood cutting takes up most of their time not otherwise spent on improvement to the reserves.

These men on the reserves are supplied with houses to live in and stables for their horses; fuel and hay are allowed free, and there are as a rule, very attractive places where they have a small garden and a pasture for their stock. Many of the Reserve houses have telephone connections, which are of material benefit in time of fire as are also the lookout towers which are built in locations where they give a very wide range of vision of the surrounding country. These towers have proved of very great aid in helping to locate fires and enabling the rangers to get to them in the shortest space of time. Fireguards are being cut and ploughed around the boundaries of the different reserves, thus furnishing a protection from fires that may originate outside of the reserve as most of them do, usually from settlers burning brush for clearing up their homesteads.

Along the boundaries of the reserves fireguards are cut from 12 to 25 feet wide and then three to five furrows are turned with the plow on each side of the clearing. All inflammable matter and brush is kept out and burned off the intervening space, and the plowed land is kept freshly disked whenever it grows up with long grass or bushes. In the early spring while the frost is still in the ground and the snow in the woods, the hay meadows and sloughs are burned off by the rangers with the aid of neighboring settlers, thus further insuring adequate protection from prairie fires.

Two-thirds is Waste.

The name "Reserve" when applied to these forest areas is rather a nuisance, for it gives the general public the wrong impression. They think that these areas are withdrawn from use, but this is not the case; for when these areas are set aside it is for the benefit of the public, all the people, and the small settler has just as much right as the big man. But when I say "use" I do not mean "abuse," which has been the case all through until the regulations were put into effect. The settler is almost as free on the reserve after it is created as before,

except that it is necessary for him to secure a permit from the officer in charge, thus enabling the Department to keep a record of his operations and not let him abuse the privilege he is granted to the detriment of his neighbors. He may secure a permit to cut wood, building logs, rails, fence posts and fuel at very reasonable rates, the Department merely requiring him to eliminate all unnecessary waste by cutting low stumps and utilizing the tops to their smallest diameter; also to burn his brush in order to clean up the woods and remove the fire danger that would exist if this material was left to dry and scattered all over the ground. Certain areas are set aside in each reserve where the settlers are allowed to cut and these places are chosen so as to be as convenient as possible for everyone. Enormous waste has taken place through all the wood operations in this country by both the lumber man, cordwood and tie operator and the settlers in getting out wood. It is a known fact that only about one third of the tree reaches the consumer after passing all through its many phases of manufacture. Is it not self-evident then that most of the remaining two-thirds is wasted and lost unnecessarily? Most of it is left in the woods to rot or burn when the fires get into the old slashings and are almost impossible to control doing great damage to all young growth that has sprung up since the original cutting off of the areas.

At the Nursery.

An experimental nursery has been in operation for several years on one of the reserves in order to determine the tree species most adaptable for planting up the barren areas. Plans have been drawn up for planting on a number of the smaller reserves and we expect to plant a portion of each of the prairie reserves during the coming year. Much care and forethought must be exercised in this work and through the co-operation of the Indian Head Nursery plants are secured to carry on the work. The Forestry Branch through the Tree Planting Division at Indian Head has for years been supplying the farmers, free of cost, trees for planting around their farms and now it is time that it was planting up some of its own non-agricultural land in the same manner.

The Grazing Problem.

The provincial authorities have for the past few years been trying to encourage the live stock industry as much as possible; and I may say that the Forestry Branch is heartily with them in this as many of the reserves afford excellent pasture which may be utilized by the settlers or stockmen under a permit system which is very reasonable. In some localities the settlers have formed stock associations to jointly fence large portions of the reserve, in which they may run their cattle during the summer season while the crops are growing.

Many of the settlers avail themselves of the opportunity of securing wild hay or prairie wool from the reserves which they may get at a very small rate of ten cents per ton. In some instances where stockmen graze their cattle during the summer season on part of a reserve they are able to winter them over on another part where they have put up hay. These men are permitted to erect corrals and buildings for their stock and the accommodation of their herders.

Public Not Excluded.

The public use of the Reserves is encouraged. Summer resort lots are leased for a long period at a small fee of $5.00 per year, the Department merely requiring the owner to erect a small house to the value of $300.00 and keep same in a neat manner. Small portable saw-mills are allowed to operate, in order to turn out rough lumber for the settlers. The prices charged by these millmen are regulated and the settler secures the

logs from the Reserve at a very low figure. In many cases a homesteader is allowed a very liberal amount free for the erection of the buildings.

Most all the forest rangers have been appointed game guardians by the province and assist to enforce the game laws. Most of the Reserves have been declared game refuges and no shooting, trapping or injury of any wild animal is permitted. If this protection is continued for a number of years these refugees will become fine game reserves, from which all variety of game will overflow into the surrounding country and thus provide a perpetual supply of good shooting and sport for the people in the surrounding communities. Fishing is permitted with hook and line but not by nets, which in a very few years might deplete the quantity in any one locality. This provides for much recreation and sport when the public visit the numerous lakes in some of the Reserves and spend days in having a pleasant camping party and a little fishing on the side; and with the game protected are to be many times rewarded for a little patience in seeing a beaver build its house, or hear the call of a moose, or possibly get a photo of a deer.

The Forest Reserves are an ever increasing benefit to the community and do not permit of their resources becoming monopolized by private parties, but are for the benefit of each and every individual.

Mr. J. D. Gilmour, recently District Forester at Cranbrook, has been transferred to the head office, Victoria.

Mr. H. B. Murray, formerly District Forester, Kamloops, is now in charge of the Cranbrook District, and Mr. E. B. Prowd is Acting District Forester for the Kamloops District.

Foresters and Lumbermen Unite at Meetings.

The Foresters' Club of Ottawa, which has done good work for the past three years, has decided to enlarge the scope and in addition to having forest engineers and forest administrators come together for mutual counsel and benefit, will draw upon the fund of experience gathered by lumbermen, particularly in regard to forest protection. This new policy was put into force at a recent meeting. The chair was occupied by Mr. R. H. Campbell, Director of Forestry, president of the club, and there were present representatives of the forestry, entomological, horticultural and seed branches and Railway Commission, Commission of Conservation and geological survey and also of fire-protective associations and Ottawa lumber firms.

The speaker of the evening was Mr. Clyde Leavitt, chief forester of the Commission of Conservation and chief fire inspector of the Railway Commission. Mr. Leavitt spoke on the work of the convention of lumbermen and foresters held at San Francisco during the recent exposition. This was followed by a general discussion in which the point was brought out that the belief of all present was that the only way to cure the forest fire menace was to have thorough and hearty co-operation among all responsible for forest protection. The work of the St. Maurice Valley and Lower Ottawa forest protective associations was endorsed and their good results recounted.

These meetings will be held periodically and a number of those connected with lumbering have signified their intention of being present. During the work of the evening, a resolution was passed expressing the sympathy of the club with the family of the late Mr. A. Knechtel, forester of the parks branch.

The Authority of a Fire Ranger

While I have noted and read many articles and suggestions of considerable value to those directly interested and responsible for the welfare and protection of our forests from destruction by fire, I observe that there is one matter which not only requires attention but is of vital importance and worthy of serious consideration and early action, if we are to continue to improve our fire protective organizations so that they become a recognized force in the land and gradually reduce the enormous losses caused through careless or thoughtless setting out of fires.

More Backing Required.

The subject in mind is the great need for a "New Fire Ordinance," especially in the three western provinces. Fire rangers are appointed each year for the sole purpose of protecting our forests from fire; an ordinance known as "The Prairie Fires Ordinance" is their only legal guide, under the statutes of which they are given no more authority or power to enforce the act than any citizen of good standing. Unlike game guardians or other officers appointed to administer the law and protect our interests, who are granted the authority to arrest and bring before a magistrate or justice of the peace any offender, the unfortunate fire ranger may catch a person in the very act of setting fire to a valuable tract of timber, and the only action he can take is to proceed, after extinguishing the fire, to the nearest magistrate or justice of the peace and swear out a warrant for the arrest of the offender. I would ask your readers where they would expect to find the culprit, after possibly making a two days' journey by canoe to swear out a warrant?

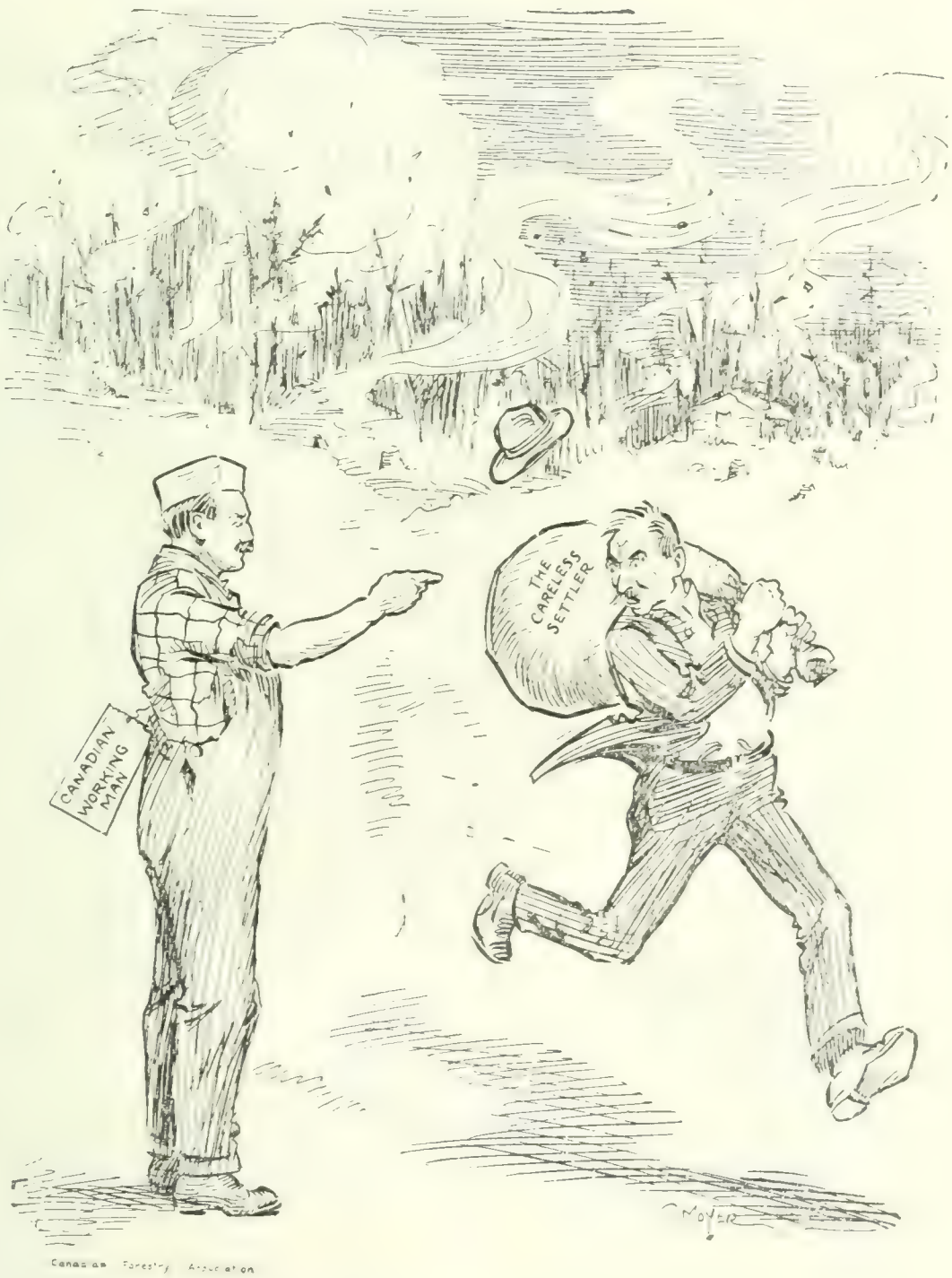
Rangers Powerless.

The very reason why so many people are careless with fire is, because they are posted in the law of the land and know there is very little to fear from their local fire ranger, who, under the present act, is given a more or less burlesque position.

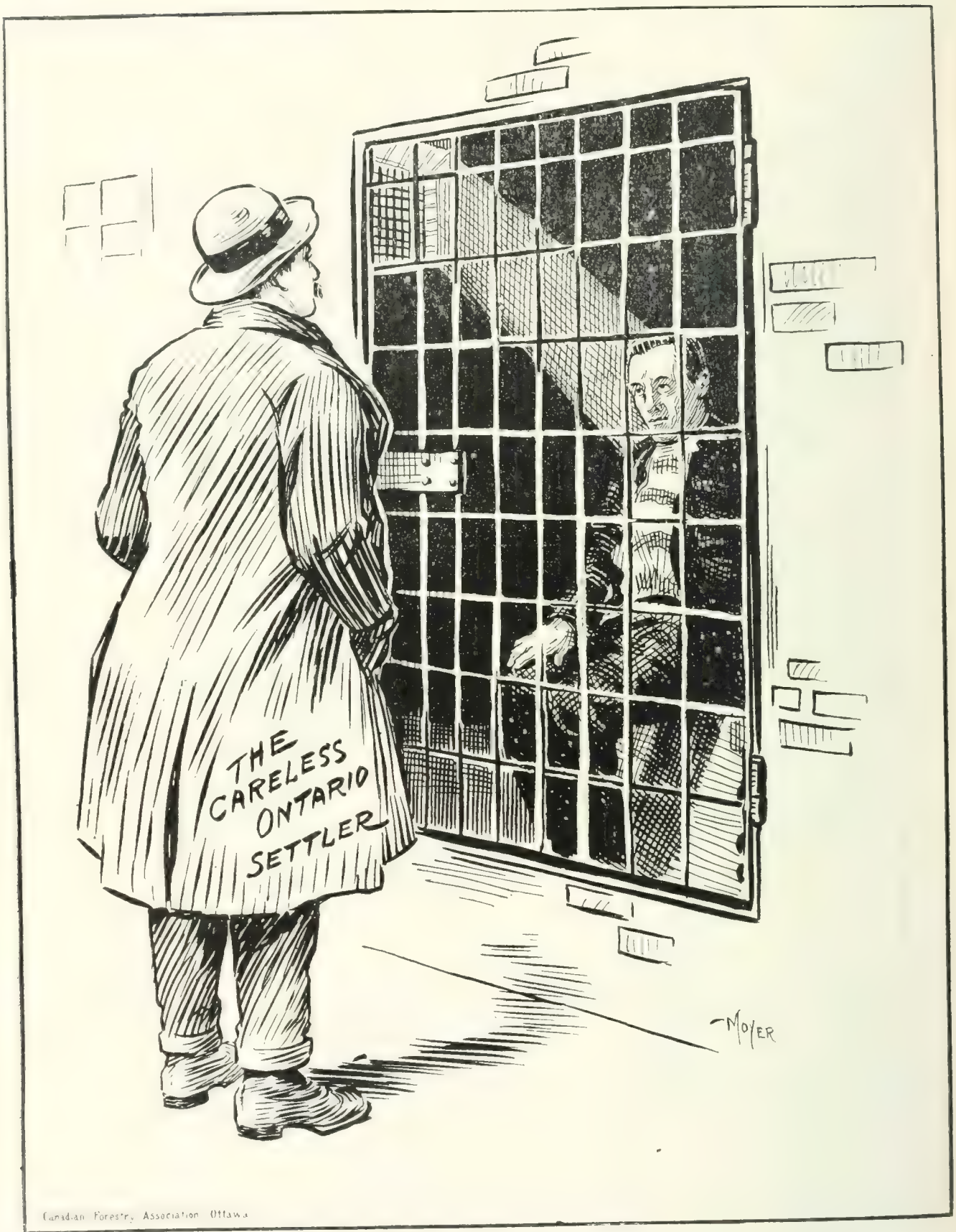
I would suggest the issuing of an amendment to "The Dominion Forest Reserves and Parks Act," granting the necessary authority to the rangers and extending the jurisdiction of the act to cover all Dominion and Crown lands.—T. McN.

The New Cartoon Service

The cartoon is a weapon which should be employed for forest protection as powerfully as it is used in politics. During the past six weeks the Canadian Forestry Association has undertaken to issue a regular cartoon service to newspapers, and the first three sent out to dailies and weeklies show a cordial reception from editors. An effort will be made to prepare two each month, dealing not only with forest fire protection but other important aspects of forest conservation. The best Canadian cartoonists are employed for the purpose and 150 duplicates in the form of stereotypes and paper matrices have been placed with newspapers. Quebec Province cartoons will be issued with regard to the necessities of the dual language. All expense in connection with this service is borne by the Association. After giving prominent space to one of the cartoons the publisher of a leading Ontario newspaper wrote: "Many thanks. If you have any more cartoons as good as this which you are passing out to your friends, we trust you will not overlook us." Other publishers appear to receive the cartoons in the same generous spirit. A few examples are reproduced in the following pages.

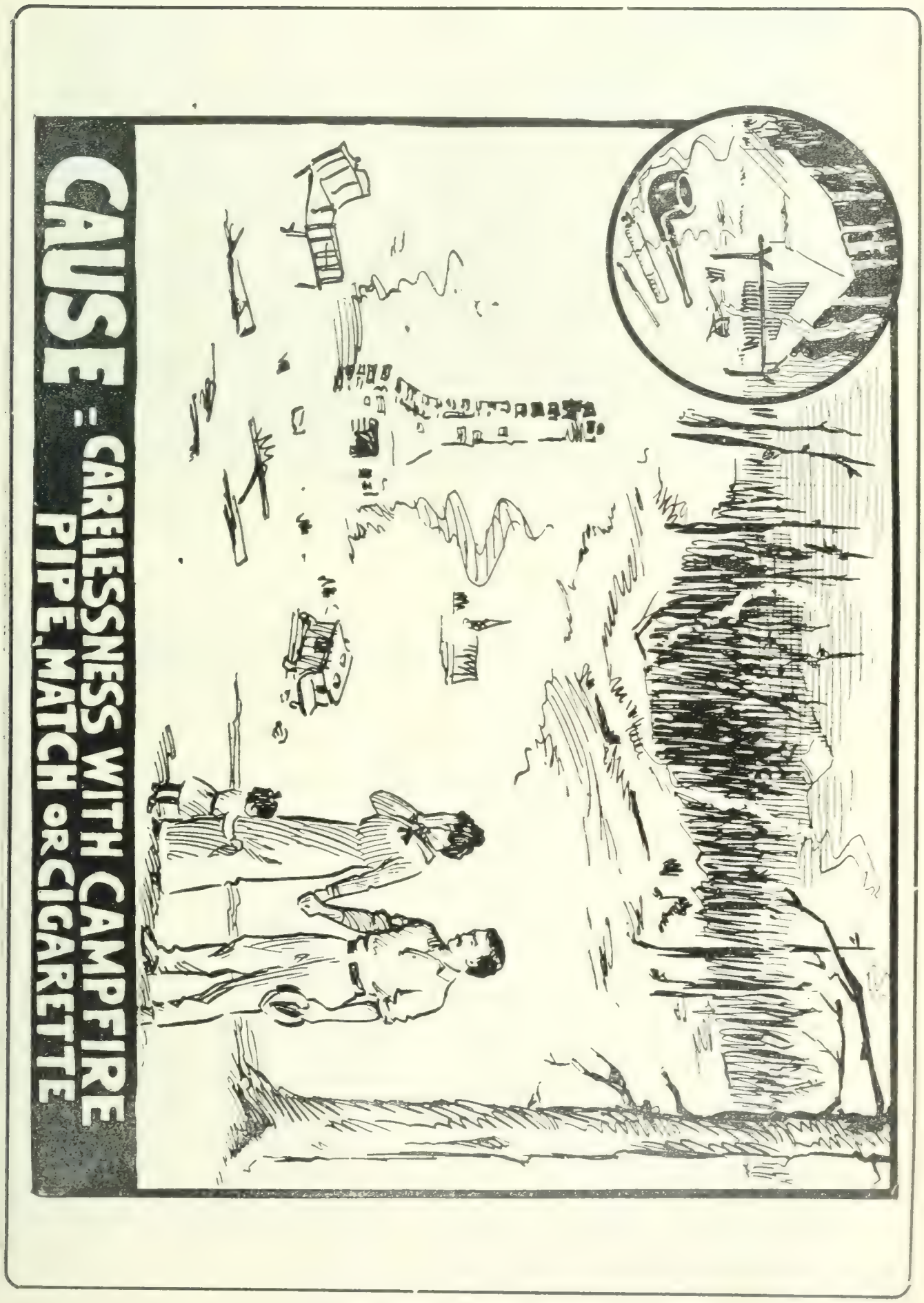


The Man-in-Overalls: "How dare you set that forest afire?"
The Fugitive: "I don't see that it's your business."
The Man-in-Overalls: "You don't eh? I represent 110,000 Canadian workmen who get their living from forest products. You people who burn down the timber are worse enemies to Canadian labor than all the alien dynamiters put together."



The Visitor: "What crime brought you here?"
The Man in Stripes: "I burned down a fifty-dollar shed."
The Visitor: "Great Scott! We settlers burned down a million dollars' worth of Ontario's forests last summer and nobody said 'Boo!'"

(Newspaper note: "Eighty-five out of every hundred forest fires in Ontario during 1915 were caused by careless settlers. Unlike British Columbia and Quebec, settlers in this province have no supervision of their clearing fires during the danger season.")


CAUSE = CARELESSNESS WITH CAMPFIRE
PIPE, MATCH OR CIGARETTE

Fire Automobile in Rocky Mountains Park, Banff, for transporting portable fire pump, hose and other tools.

Better Apparatus for Fire-Fighting

By H. C. Johnson,

Fire Inspector, Board of Railway Commissioners.

Much has been done or suggested in the prevention and discovery of forest fires, but we have heard very little of progress being made in the methods of extinguishing fires. Apparently this most important phase of protection has been neglected. Modern management of forested areas, and modern trend in the discovery of forest fires bids well to far outpace the present methods used to extinguish fires. In the matter of extinguishing or combatting forest fires a review of present day methods does not show up very well when compared to the gigantic strides made in the modern methods of attacking fires in our cities and towns. An extract from the annual report report for 1911, United States Forest Service states as follows:

> "An analogy has often been pointed out between protecting forests and protecting cities against fire; this analogy is worth reiterating. City property cannot be made reasonably safe unless there are, first: regulations to lessen fire risk in the form of building ordinances, rules regarding combustibles, etc.; secondly: a considerable investment in signals (fire alarm boxes), fire fighting apparatus and quarters, and thirdly, an adequate and well-organized force of disciplined men suitably located. So forests must

be guarded against causes of fire and conditions favorable to its spread, must be equipped with means for discovering, reporting and reaching fires and must be manned with a reliable body of fire fighters, stationed at the points of greatest need."

In my opinion, to this should also be added modern mechanical fighting apparatus with which to fight forest fires.

Many forest fire fighters have placed their views on record in this particular direction and in the words of one of them: "It was found that merely the quick and accurate locating and reporting of fires in conjunction with the old methods of fire-fighting with pine tops, wet gunny sacks, shovels, etc., did not by any means suffice for fire control." Again I quote the utterances of another: "It was found that the most energetic use of the old ordinary methods of fire fighting was entirely inadequate."

Need of Better Apparatus.

The question of supplementing the old fashioned fire fighting equipment, namely, the pine top, gunny sack, axe, shovel, mattock and water pail—for old-fashioned they are in these days of modern trend toward mechanical devices, has been one of the problems under consideration by the officers of the Dominion Parks Branch, Department of the Interior of Canada, for some considerable time. It was conceded there was a need for some mechanical device that would place in the hands of forest fire fighters a means whereby water could be taken from a natural or artificial source of supply to the scene of a fire in sufficient quantities that would make the use and adoption of such mechanical devices practicable.

The aim was to devise some mechanical method of transporting water from the nearest source of supply to the fire. This meant the adoption of a suitable type of engine and pump with water line. After studying various types and arrangements of engines and pumps and keeping in mind the vital question of weight, portability and easy manipulation, a marine type two-cylinder gasoline motor was decided upon to supply power. This was coupled to a special rotary pump and the whole and necessary attachments were mounted on a single base. The principle worked out is based somewhat on city fire fighting methods, that of engine, pump and hose; in practice, the placing of the engine and pump at a source of water supply and forcing water through a line of hose to the scene of a fire. There were, however, many factors that had to be taken into consideration, principally that of portability, which governed weight. Three other features, to which much attention was given were quantity of water per given time, distance, and height water could be delivered. These features combined were in turn governed by the amount of power it was found possible to develop, which in turn was governed by the greatest amount of horse power it was possible to get out of the assembled parts without exceeding a fixed weight. Ultimately a gasoline portable pumping unit No. 1 was built. This outfit will pump approximately 20 gallons of water per minute, and has actually in tests lifted water 172 feet, vertical height. In a capacity test, water was pumped through 1,500 feet of 1½ inch hose to a height of approximately 85 feet. A description of the outfit in detail follows:

Base of Aluminum.

Engine, marine type 2 cylinder, 2 cycle, water-cooled, rated 4 to 5 H. P. Exhaust manifolds of copper, Ignition, Bosch magneto, driven from fly-wheel shaft. Circulating water is taken from delivery side of pump and regulated by a small valve.

Lubrication, sight feed to shaft bearings, cylinders, pistons, cranks and crank pins by mixture with gasoline fuel supply. Crank encased. Fuel supply by gravity system. Fuel tank holds one gallon of gasoline. Base of aluminum bolted to oak baseboard.

Pump, bronze rotary, 2-inch suction, 1½-inch delivery. Capacity 20 gallons per minute.

Engine and pump are coupled direct. The overall dimensions are approximately as follows: 21 inches high, 17 inches wide and 28 inches long, and the combined weight, complete with gasoline tank holding one gallon of fuel, couplings for suction and delivery hose, pressure gauge, oak base-board and carrying handles complete, ready to run, is 135 pounds. At first, one-inch rubber-lined cotton hose was used. It proved, however, too heavy and it was decided to use 1½ inch diameter linen hose; 1,500 feet weighs 240 pounds complete with couplings.

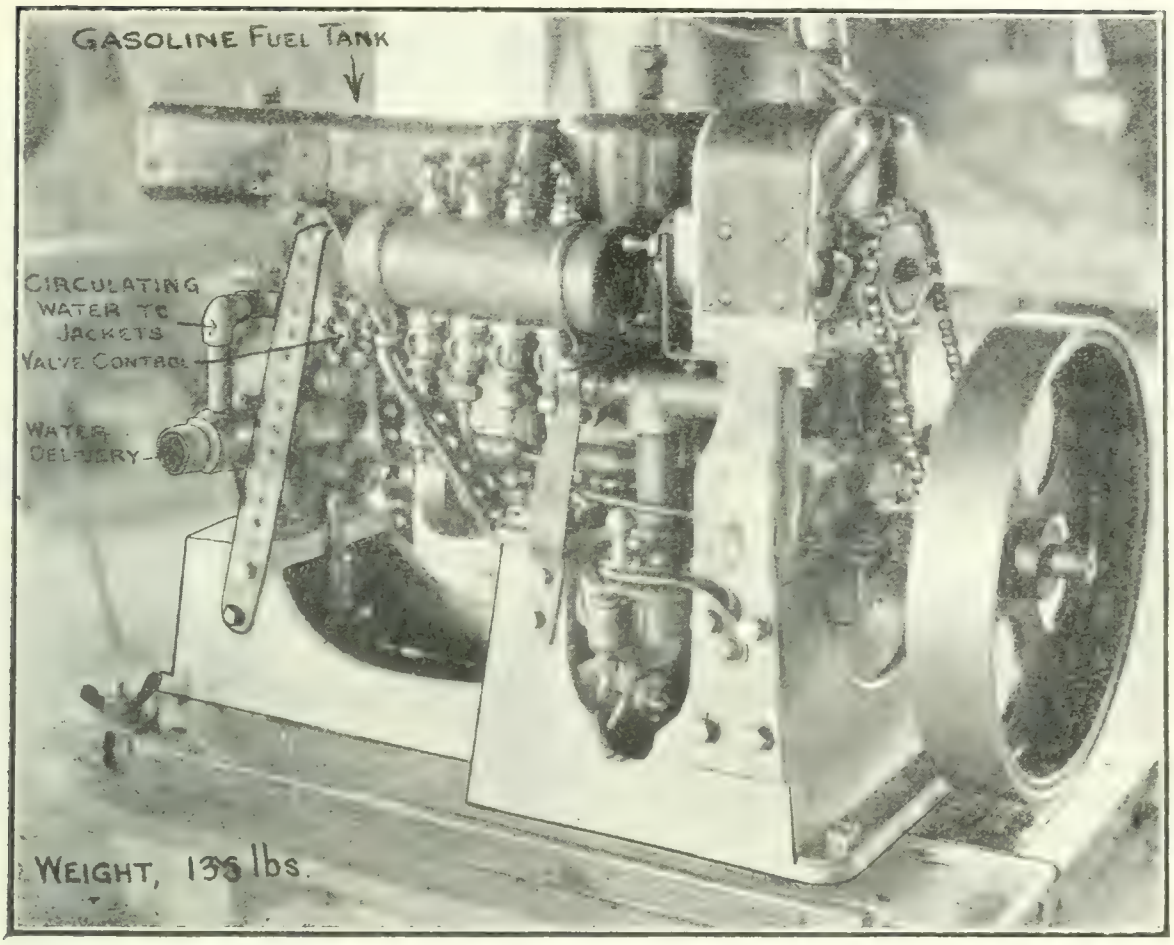
Tests Statisfactory.

The method in which it is proposed to use such apparatus is in units of two or more according to conditions prevailing in the territory in which they may be adopted; each unit relaying water by the use of canvas tanks. In this manner, No. 1 pump, placed at the source of water supply, pumping into a canvas tank, would supply No. 2 pump, which in turn would supply a third outfit, and so on. Under ordinary conditions, when the ground is practically level, two pumps, by relaying should supply water approximately 2,500 feet from the source of initial supply. In country which is rough and mountainous, it might be possible to have No. 1 outfit deliver water only 500 feet away, but 150 to 170 feet above the point of suction, and then No. 2 outfit would relay a further 1,000 feet, and 75 to 80 feet more elevation, so that water would be delivered 1,500 feet from the point of suction at approximately 245 feet elevation. No. 1 outfit has already been used in practical work in the Rocky Mountains Park at Banff, controlling slash-burning operations. Those in charge report that the whole apparatus was given a very fair four-day test while burning large piles of brush and small timber and undoubtedly enabled the fire to be kept within the required area. Water was taken from the river and pumped to points where required, varying from 50 to 150 feet above water level. A pressure of 90 pounds was developed and a stream of water was thrown about 40 feet from the nozzle. It enabled the brush to be burned in large piles within a clearing of 40 feet in very dry weather without scorching the trees. The fire was kept within bounds and completely extinguished before leaving in the evening. By holding the nozzle close to the edge of the fire, a ditch from four to six inches deep was made all around the fire, at the same time saturating the ground. Calculating the pump discharged 20 pails of water per minute, and allowing a man 10 minutes to carry a pail of water over the same distance pumped, a speed which could not be maintained long, due to the hilly nature of the country, it is evident that the pump did the work of at least two hundred men, thus showing its great efficiency in this direction.

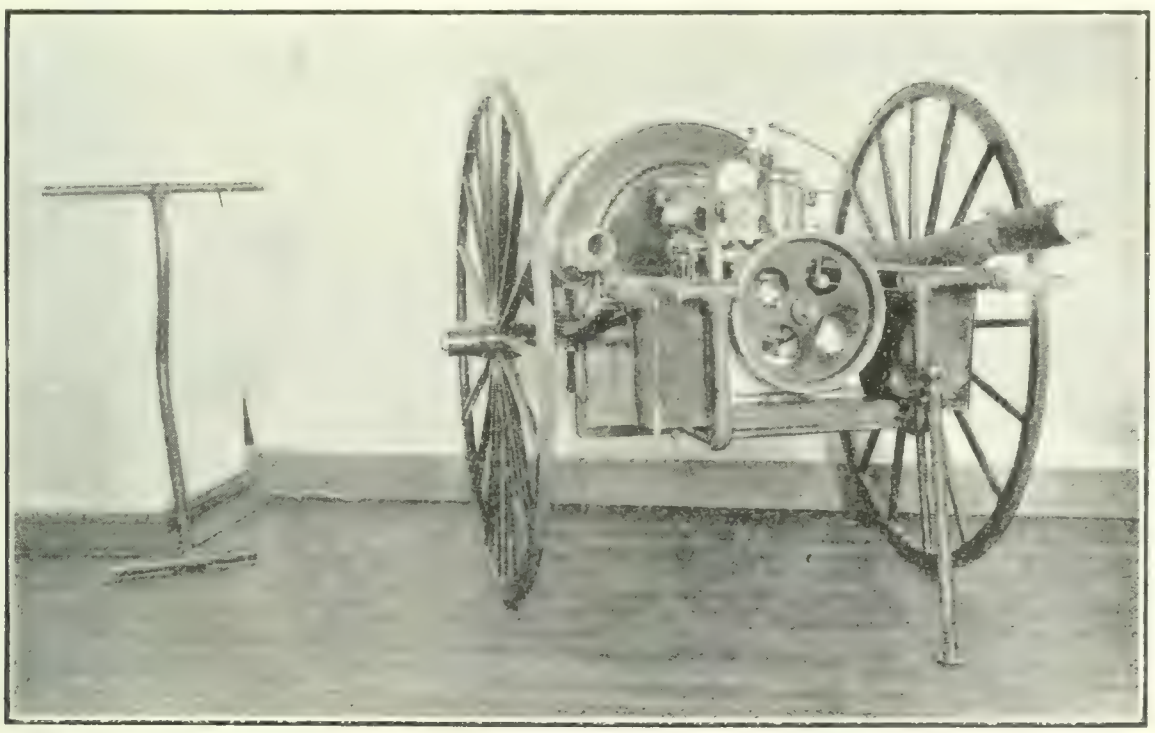
Simple to Transport.

For the rapid transporting of the outfit and necessary hose along any of the roads in the Dominion Parks, an automobile chassis equipped with a suitable box body, into which the outfit is loaded, enables any point alon gany of the roads now existing in the Dominion Parks to be reached in a very short time. For carrying over suitable trails, a specially designed truck was built to be either hauled by hand or horse power, the gauge between the wheels being three feet.

The outfit can also be packed on



pack-horses, and by having the fly-wheels of the engines made detachable to reduce weight, by using a suitable frame of light construction, two pumps can be packed on one animal, the hose being packed likewise.



Engine Truck.—Carries engine and pump forward. Reel holding 200 feet of one-inch hose in rear. Suction with coupling and strainer and auxiliary gasoline tank holding five gallons also lubricating oil tank holding one gallon. Tool box. Water pails and other tools that can be strapped to frame.

Where it is impossible to take pack horses the outfit can also be carried by two men. In territory where there are numerous canoe routes, as for instance in the Algonquin National Park of Ontario, little difficulty should be experienced in transporting one or more such outfits in canoes.

Other Uses of Engine.

There are many ways in which the use of a portable outfit of this type can be used in the forests besides the actual fighting of fire. Such uses are back-firing and controlling slash-burning operations. The question of water supply can be taken care of, where natural supply is lacking, by the artificial storing of water at suitable points. This can be done by construction of dams across small creeks to impound the necessary supply of water or by the sinking of shallow wells, or other artificial methods of storing water. Usually in forested territory water is found in valleys, where the majority of fires start.

The writer does not advocate the adoption of mechanical apparatus in a haphazard manner. Such apparatus will only be used successfully in conjunction with other up-to-date fire-protective measures. One most essential feature is the preparation of forest-plans of the territory in which it is proposed to use such apparatus. Such plans, in addition to showing the usual physical and forestry features, should show in detail all points where water can be obtained. Contours should also be shown at least every hundred feet, or better still, every fifty feet. And at the back of it all must be a thoroughly organized force of men suitably located.

The Handicap on Forestry

Dr. Judson F. Clark Explains the Necessity for New Economies in Logging Operations—Increased Stumpage Values.

The greatest hindrance to the progress of forestry in this country is the low level of stumpage values. In Europe, where labour is much cheaper and stumpage values several-fold higher than with us, forest properties may be maintained on a perpetual yield basis and pay a fair return on the investment. What obtains in Europe to-day will obtain in America to-morrow. The practical question is, "How may we hasten it?" In a large measure the answer to this question will be found in the development of the art of the logging engineer.

Stumpage is that which remains when the cost of marketing the forest product has been paid out of the returns from the sale. Obviously, there are but three ways of increasing stumpage values, namely, by raising the price of the product, by eliminating waste, or by reducing the costs of marketing. Unhappily, the price of lumber, the main forest product, is determined by a great variety of considerations, most of which are wholly beyond the control of the friends of the forest.

Use of By-products.

The utilization of materials previously wasted makes slow progress. There have not been nearly so many by-product developments as could be wished, and every step in advance—no matter how rich in early promise of good financial returns—

largely defeats its own hopes on account of the overwhelming supply of raw materials on the one hand and market limitations for the product on the other.

Until lumber prices substantially and permanently advance, the main hope of bettering forest finances, and thereby widening the field where forestry may be practised, rests in lowering the costs of marketing the forest crop.

The cost of marketing the forester's crop may be roughly divided into logging costs, milling costs, lumber transportation, and selling costs.

The sawing and finishing of lumber, together with lumber transportation, have already been highly standardized. No doubt many further economies will be effected in these departments from time to time. A start, which has every promise of large results, has already been made in the, heretofore, much neglected field of lumber salesmanship. But perhaps the largest field for economies is that of logging, and the hope for greater efficiency in this quarter is in the development of the art of logging engineering.

The Science of Logging.

As agriculture calls to its aid so much of the sciences of chemistry, physics and biology, so the logging engineer, in the development of his profession, takes toll from the whole field of mechanical science, and calls for much of the best that has been produced by that modern alchemist, the metallurgist. No occupation calls for greater resource and adaptability. Every logging unit differs from every other in the complexity of variations in topography and stand; of the thousand ways in which logging may be done there are not many profitable ways, and there is, of course, only one best way. The man who knows and can effectively carry out one or more of these better ways is a potential logging engineer.

The successful logging engineer of the past has compelled success by a more than average ability and adaptability. How may the average logging foreman improve his methods and thus take the first steps to qualify as a logging engineer? Must it not be through bringing to him the results of the best thought of the thousands of men who are devoting their lives to this work?

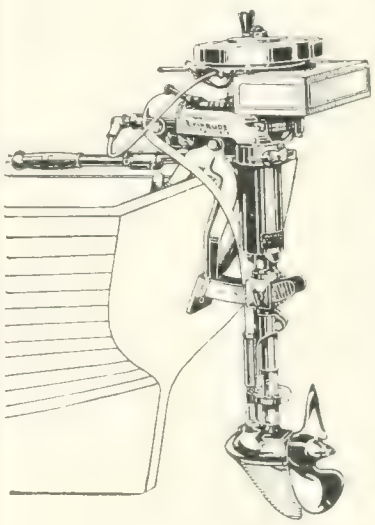
The graduate of the forest school, with a special training in the department of logging engineering, may hope to be of considerable service to a logging company from the start, but, to be of the greatest service in the end, he must be willing to start his practical apprenticeship at the bottom and work up.—Dr. J. F. Clark, of Vancouver, B.C.

"The Forests of the District of Patricia"

In the February issue of the Canadian Forestry Journal will appear an article under the above heading by Mr. J. B. Tyrrell, M.A., F.R.S.C., F.G.S., the well-known mining engineer and explorer, who was delegated by the Ontario Government to report upon the resources of the new District of Patricia and the harbor possibilities at the outlet of the Nelson River. No one in Canada is better fitted to handle an informative discussion of the forests of Patricia and the article is done with Mr. Tyrrell's usual skill. A number of excellent photographs will illustrate the text.

Mr. L. R. Andrews, formerly District Forester at Vernon, is now in England, a lieutenant in the Canadian Expeditionary Force. Mr. G. P. Melrose is now Acting District Forester for Vernon District.

EVINRUDE



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How Japan Fights Fires

Patrol methods are followed in protecting Japanese forests from destruction by fire, a ranger's district covering from 5,000 to 6,000 acres. Volunteers fight the fires. When areas are cleared for reforesting, lines of about 40 yards in width are left open, and kept clear to prevent the spread of fires. In Japan there are seven major forest districts, and within these are 205 subdivisions, all under comprehensive control. Areas may be cleared for farming, but in Japan the farm units are small, averaging only three acres for each farm.

White Bark Pine's Range

Some new northern range marks for Pinus albicaulis, the white bark pine, were reported last summer by members of the British Columbia Forest Service. Mr. H. R. Christie found some rather large trees growing at the western end of Eutsuk Lake, and also on the shores of Whitesail Lake, a smaller lake immediately north of Eutsuk and separated from it by a short portage a little over a mile in length. The latitude is about 53° 30′ and the altitude of the lakes in the neighborhood of 3,000 feet, The lakes lie at the extreme western margin of the great interior plateau region, directly against the eastern side of the Cascade Range, which extends along here like an enormous wall.

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"Somewhere in Belgium"

(The following interesting letter was received by Mr. R. H. Campbell, Director of Forestry, from Mr. A. E. Wyatt, who was employed as clerk in the office of the Tree Planting Division at Indian Head:

Rest Camp, Somewhere in Belgium,
Dec. 5, 1915.

"Words can hardly convey the pleasure the receipt of your Christmas card, photographs and typed note regarding the case of apples, gave me. It is as good as a physic getting such kind remembrances from dear old Canada and from employers with whom I was working such a little while. It only makes one keener, if possible, to once more take up the work which was getting so very interesting. I shall look forward with great relish to the case of apples and I will of course notify you of their arrival. The photos are excellent and a happy reminder (two of them) of some happy days spent at Indian Head and if I am spared I shall lose no time in getting back there. I have sent the photographs to my wife for safe-keeping as in our valises or haversacks they would stand a very poor chance indeed. I hope you are and have been keeping well during the year, I was glad to hear from Mr. Norman Ross some little time ago to the effect that they had had a very satisfactory season. Also, apart from this, that the crops of Saskatchewan, and in fact all Canada, have been good. Canada has certainly earned a good name for herself over the troops she has supplied and is still ready to supply. The boys of the first contingent just certainly made a great name for themselves and things have gone excellently with their contingent. We were not over here much over two or three weeks before we were order to take over a front line of trenches. Thes particular trenches we hold now. At one point, known by us as the "glory

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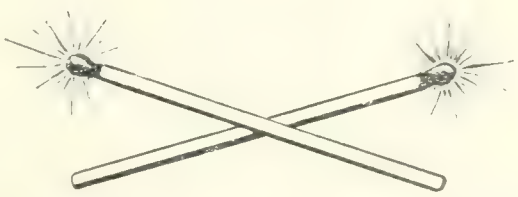

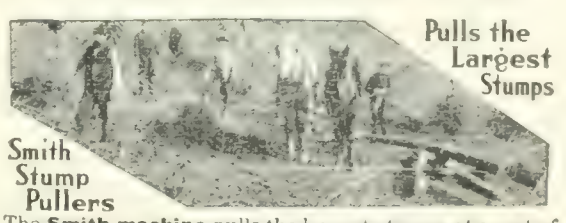

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hole" we are only a distance of 35 yards from Fritz and sometimes quite a comic conversation has been carried on between ourselves and the poor beggars opposite. On the Kaiser's birthday I should imagine they must have had a pretty heavy ration of rum for they were very hilarious. They once set off a mine under one of our companies and did some ugly damage, but they paid very heavily indeed for it for we gave them a heavy dose of pills in the shape of "coal boxes" and wizz-bangs. We have had, of course, some very uncomfortable times in the trenches recently owing to the rain and mud. The latter for five days was up to our knees and entrance and exit to the trenches was sorry work as it had to be done over open ground. I hear that snow is now well on the ground and I do hope that things are well at the forestry station. I trust you will excuse my writing this letter in pencil but ink is a rare commodity in these parts. Thanking you once again for your kind thoughts, which have been appreciated more than I can say, I must now close, hoping you will have a Happy 'Xmas and that the New Year will bring you good luck and the best of health."

To Increase Uses of Lumber

The General Extension Division of the University of Minnesota is now offering a correspondence course in "Lumber and Its Uses." The object of this course should not be misunderstood. It does not deal with the common knowledge of the superficial characteristics of lumber that every lumberman and every woodworker rightly believes himself to know better than any "professor," but rather with the facts and technical data which make for an exact understanding of the structure and actions of wood as a construction material.

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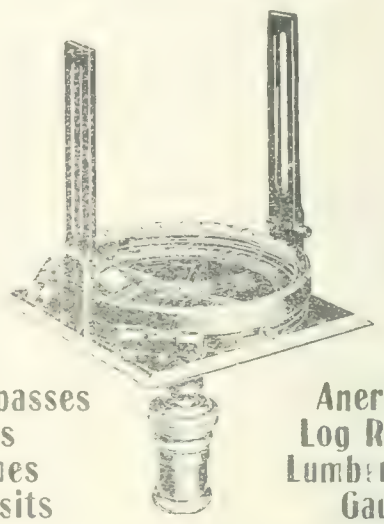

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By Professor H. H. Chapman, Yale University.

A valuable book for those not already familiar with the economic and mathematical principles on which the theory of forest finance is based.

283 pages, 6x9. Cloth, $2.00 net.

ELEMENTS OF FORESTRY

By Professors F. F. Moon and Nelson C. Brown, N. Y. State College of Forestry at Syracuse.

Covers, in an elementary manner, the general subject of forestry.

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LOGGING

By Professor Ralph C. Bryant, Yale University.

Covers the more important features of operation. Discusses at length the chief facilities and methods for the movement of timber from the stump to the manufacturing plant, especially logging railroads.

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By Henry Solon Graves, The Forester, U. S. Department of Agriculture.

Contains chapters on The Selection System, The Coppice Systems, Improvement of the Forest.

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THE THEORY AND PRACTICE OF WORKING PLANS (Forest Organization)

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In preparing this book the author has constantly kept in mind the experience which he gained while doing active work for the Forest Service in various parts of the United States.

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Settlement and Forest Protection Near Cochrane

By Judith Kingdon in "Saturday Night."

EDITOR'S NOTE.—The attention of readers of the Journal is called to the following article in Toronto Saturday Night. According to the author of it the general conditions of Northern Ontario in the neighborhood of Cochrane form an incentive to deliberate forest destruction.

As something very worthy their attention, I should like to see the Government of Ontario make a thorough and exhaustive enquiry into the waste of human energy and hope, and their possible conservation, in the settlement of the northern part of their province.

It should be made possible for the first man who takes up a lot to stay with it and succeed. As things are now, a large percentage of those who take up lots, after one year or two years, or three years, decide they cannot make it go, so they leave. Should the settler be given his lot with a few acres cleared, stumped and ploughed, giving him a better chance to stay on his lot? The charges against this improvement could be made payable at some future date when the farm was a going concern.

It is true a great deal of road work has been given the settlers, but when they are doing this work is the time they should be logging up and stumping on their lots. They cannot stump in the winter. Many settlers have left since the road work stopped.

Nor can the average settler make a living out of his timber. The government tells him he can sell every stick on his lot. This is really true. He can—but not at a profit, often at some cost. A man I know has just sold some pulp-wood. On every cord he sells he loses nearly a dollar. But since he has it cut, he must do that or suffer a total loss. He is not going to cut any more pulp-wood. It is the same with fire-wood and saw-logs. Only those near a station, siding, or mill can make even wages. The haul kills it. Moreover, the settlers are scattered, and one team can keep the road open only with the greatest difficulty, on account of the depth of snow and its sand-like quality. He usually cannot draw a full load.

Timber of a size suitable for saw-logs is mostly scattered, making the cutting and skidding too expensive. If much small stuff be cut, again the haul kills any profit on account of the extra number of slabs. If he live far out, he cannot give away his timber on the stump.

When the settler has "burned his fingers" this way, or watched his neighbor go in the hole, he begins to think favorably of fire. If he can fire his bush standing, he is inclined to do so. Then the stumps are rotting and the dead trees keep constantly blowing down. After that he tries to coax the fire through each summer, burning much of the fallen stuff and weakening the stumps. Incidentally he burns off all his black muck, so he may later have to persuade a crop of clover to grow to be turned in. He also quite frequently burns out several of his neighbors or himself.

Dean Adams on Forest Preservation

At a recent meeting of the Montreal Forum, Dean Adams, of McGill University, spoke very strongly about the need of safeguarding our forests. This is a subject which has been brought to the attention of the public so much in the past that doubtless a considerable number are weary of it, but there seems no other way to arouse public opinion than by this process of reiteration. The question is too important to leave to individual effort. A progressive firm or individual here and there becomes so impressed with the national danger that action is taken, but the great mass of those concerned do little or nothing in the matter. It is just for these that Dr. Adams' warning is published.

After showing that our forest areas were being depleted at a rapid rate, he went on to point out that the forests in the Northern belt were not of such value as those in the Southern belt, but in the latter the really good timber was seriously depleted. One-half of the total timber in the Dominion was located in British Columbia. There had been enormous destruction of forests in the past, the lumbermen having cut out the trees in such a way that the latter contributed to he spread of fire, and more imber had been burned down than had been cut by the lumbermen. In some instances the fires had so seriously affected the soil that replenishing was out of the question. Dr. Adams referred to the methods of the St. Maurice Forest Protective Association, and of the Lower Ottawa Association, to guard against fire, and said their efforts were examples of what could be done to resist fires.

It was supposed by some that the northern forests were inexhaustible; surveys, however, showed that this was a mistake, and it was possible that our forest wealth could be exhausted. How could we conserve our forests? We could protect them from destruction by fire, and he was glad to note that in British Columbia efforts were being made to this end. We must also replant our forests, and follow the example of European countries, where reafforestation had proved successful. He suggested in particular a scheme for conserving the forest resources in the northern belt, so that the country would have a permanent source of supply which would bring in a large annual revenue. The reason why such a scheme was not carried out was to be found in the changing character of governments, who preferred to pass it on from time to time rather than incur the great expense. A strong public opinion was needed in order to force a government to take up this question; it was only in this way that any government could be compelled to make the necessary expenditure.

One thing is certain. Our forests are not inexhaustible, and further, there is little or no concerted action on the part of the authorities to safeguard and preserve them. Action is needed.—(Pulp & Paper Magazine.)

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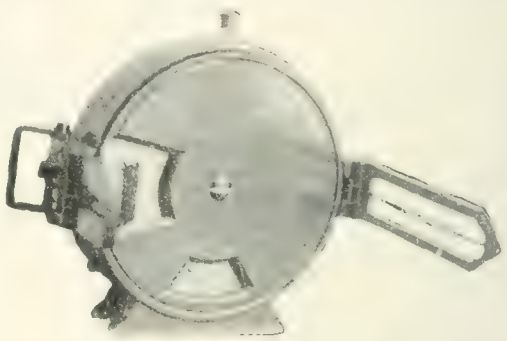

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Canadian Forestry Journal

FEBRUARY, 1916.

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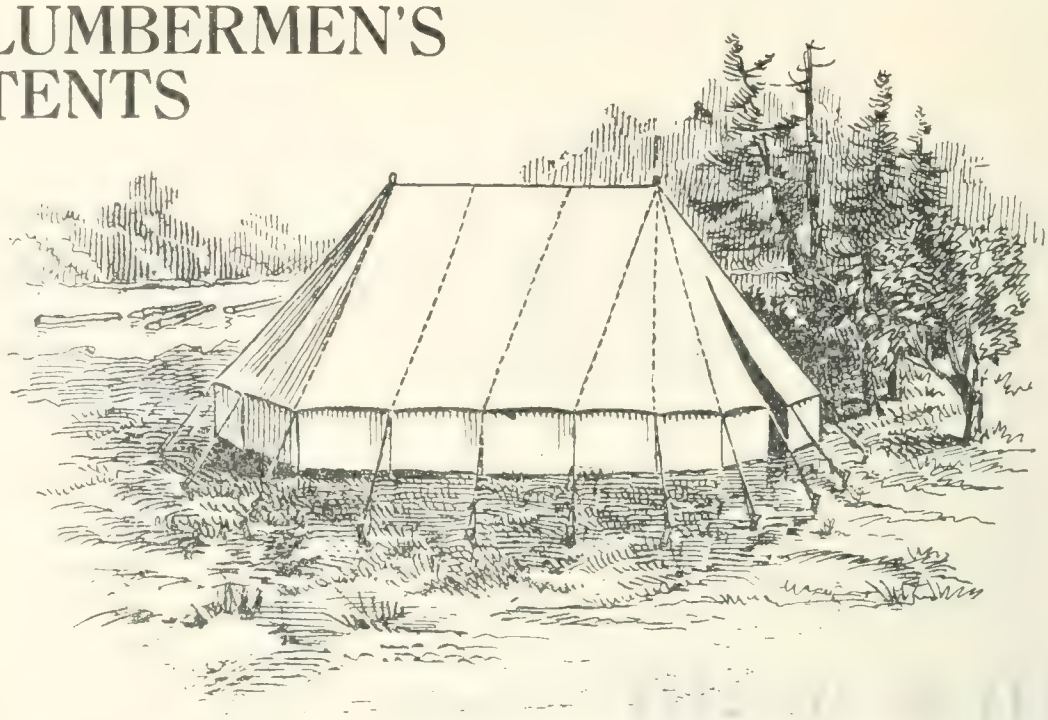

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J. B. T. Photo.

Clay plain in the Northern Subdivision of the Upland Country.

Forests of the District of Patricia

Population, 3000 Indians, 9 Whites—Average of Whole Country About Two Cords Per Acre.

By

J. B. Tyrrell, M.A., M.E., F.R.S.C., F.G.S.

The district of Patricia lies in the extreme North-western portion of the Province of Ontario and constitutes that vast new country which has recently been handed over to it by the Dominion. Up to the last few years it was an unorganized and practically unknown portion of Canada directly under the control of the central Government at Ottawa. It has an area of 150,000 square miles, more than three times the

size of the State of New York, or about one-fourth larger than the combined areas of Great Britain and Ireland. Unlike the rest of Ontario it faces on the sea, with a shore line on Hudson Bay 600 miles in length. In shape it is roughly triangular, with a greatest length in a north-east and south-west direction of 630 miles, and a greatest width in a north and south direction of 390 miles.

It is inaccessible, except with light canoes, from any of the southern and more settled parts of Ontario, and none of the main lines of travel used by the early fur-traders of the Hudson's Bay Company passed through it, either on their way southward from Moose Factory to the Great Lakes, or westward from York Factory to the plains of the Saskatchewan or the forests of the Athabasca valley. No attempt has yet been made to develop any other industry but the fur trade, and consequently, though not at all the most remote, it is one of the least known parts of Canada.

Population Meagre.

It is very sparsely populated, the total number of people in it, according to the last census, being 3,009, about 9 of whom are white fur traders, while 3,000 are Indians belonging to the Cree and Ojibway tribes who live by hunting and fishing, though a few of the more civilized have small gardens in which they grow potatoes. The above population gives an average of one person, man, woman, or child, to every fifty square miles of country.

Like most of northern Canada, it is a country of slight relief, with few prominent hills. The highest land, with an elevation of about 1,500 feet above the sea, lies in its south-western portion, in North Latitude 52° and West Longtitude 92°, and from this high land as a centre the streams radiate in all directions, northward, southward, eastward, and westward, but no matter in what direction they start, their waters eventually reach Hudson Bay. The main rivers, beautiful large streams, are as follows with their respective length: Albany 610 miles, Attawapiskat 465 miles, Wenisk 400 miles, Severn 420 miles, and English or Winnipeg 330 miles, the latter of which drains a portion of the district south-westward into Lake Winnipeg before its waters are carried by the Nelson River into Hudson Bay.

The district naturally divides itself into two portions, namely a Littoral portion, which adjoins Hudson Bay and extends 100 miles or more inland from it, with a total area of 60,000 square miles, and an Interior Upland portion, including the higher land already mentioned, with a total area of 90,000 square miles, or nearly 60,000,000 acres.

The Interior Upland Country is underlain by old Archean rocks, chiefly red and gray gneissic granites. Their surface is undulating or lumpy, with few level areas of any considerable extent, but at the same time the crests of the lumps or undulations are low and rarely rise into hills with heights which would need to be expressed in hundreds of feet.

Agricultural Soil.

This rocky Interior Upland may again be divided into two main subdivisions, a Northern and a Southern, though sufficient information is not available to determine their relative areas. The Northern subdivision comprises that portion which has an average slope northward and north-eastward, and is drained into Hudson Bay. On it the underlying granite is mostly covered by a mantle of recent hardpan or sandy clay containing an abundance of boulders. Doubtless this covering is thinner on the hills than in the valleys, but nevertheless the rocks of the hills are usually hidden, while the deeper depressions in the original rocky surface are

mostly filled with a stony clay. A few rock-basins remain and are occupied by clear lakes, such as Trout Lake, but most of the lakes occupy shallow basins in the loose surface deposits, with low sandy or stony, rather than rocky, shores.

When the country is opened for settlement much of the loose surface clay will form excellent soil for the growth of farm crops, for where Indian hunters can grow potatoes, white farmers can grow very many other things.

Here and there, sand hills rise above the general level and form conspicuous objects in the landscape. On the tops of the stony knolls or of the sandy hills Banksian pine up to 10 inches in diameter is often growing, while on the sides of the hills, where the slopes are not too gentle, are groves of white spruce up to 12 inches in diameter, while similar spruce trees also form belts along the banks of the streams. Between the hills are more or less extensive mossy swamps, from the surface of which rise a few small scattered spruce and tamarack.

J. B. T. Photo.

Rocky Country at the Head of Cat River.

Signs of Burning.

Along the course which I travelled in 1912 from Trout Lake up tributaries of Severn River to the headwaters of Cat River about half of the timber had been burnt a few years before, and was still standing as blackened or bleached tree trunks. On this route the timber, counting both burnt and unburnt trees, would probably average, over hills and swamps, about ten cords to the acre. I cannot say definitely whether this estimate would hold true for the country on the Wenisk and other rivers east of the route which I followed, but judging from a careful examination of the reports of Messrs. Bell, McInnes, Dowling and other explorers, I should think that it would.

The Second, or Southern, Subdivision of the Upland .Country sloping to the south end is mostly drained into the Albany River. On it there is little soil of any kind over the rocky hills. The lakes are irregular bodies of water filling larger and smaller depressions in the rock itself, and cover a much larger portion of the surface than in the country farther north. Swamps are not so numerous or extensive as in the northern country, their places being generally taken by the lakes which fill the depressions. Clay or clayey soil is almost absent, for instance, at the Trading Store on Cat Lake there is nowhere in the vicinity enough clay to chink the cracks between the logs.

The trees are mostly small black spruce, tamarack and poplar. Banksian pine is not abundant, but there are a few groves of white spruce here and there on the hills and on the banks of the streams. Where trees are growing on the hills they seem to be supported either by the matting together of their roots, or by sending these roots down into the cracks in the rock. In some places such trees as were standing presented the appearance of growing out of the smooth bare rock.

Few Cords Per Acre.

Where the timber is so irregularly distributed as it is in this rocky country it is difficult to make a rational estimate of its quantity, but taking the whole surface area into consideration I think that it might average from 3 to 5 cords to the acre.

The Littoral Plain extends from the border of the Interior Rocky Upland down to the shore of Hudson Bay. In some places it is underlain by granite and other rocks of Pre-Cambrian age, and in other places

J. B. T. Photo.

White Spruce on the bank of the Fawn River in the Archudsonian Swamp.

J. B. T. Photo.

Burnt Timber on one of the branches of Severn River in the Interior Upland.

by flat-lying Palaeozoic limestones, but such rocks, whether granites or limestones, are almost everywhere buried beneath a thick deposit of clay and sand representing the old bottom of Hudson Bay when the land stood four or five hundred feet lower than it does at present. The ancient sea bottom had been composed of a very even floor of sand and mud, and as it rose in comparatively recent times, geologically speaking, it formed a vast and apparently level plain, with old beaches left as sand and gravel ridges on it at various elevations, formed during periods when there were pauses in the process of land elevation. The present shore of Hudson Bay, on the margin of this plain, is marked by a gravel beach six to twelve feet high. From this beach the land continues the same gentle slope northward and eastward out beneath the tidal waters of the Bay, so that at ebb tide it is possible to walk for long distances along the tidal shore.

A Gigantic Swamp.

The Littoral plain has an average slope towards the Bay of five feet to the mile, and a width of about one hundred miles, so that at its inner border, where it joins the rougher Interior Upland, it has an elevation of from four hundred to five hundred feet above the sea. Several large and many small streams flow down this slope from the rock Interior Upland to the sea, and in their courses have cut channels, sometimes a hundred or more feet in depth, through the soft superficial clays and sands, to the underlying rock, but these channels have nowhere been widened to any considerable extent by lateral erosion, and have not been converted into maturely sloping valleys. This great plain, with only two or three hills breaking the monotony of its sur-

face in the whole District, is covered everywhere, except on some of the more prominent parts of the old gravel beaches, by a layer of bog mosses from two to five feet deep, and is thus one continuous swamp, broken only by the narrow channels of the streams which flow across it. In no case was any such great depth of moss discovered as is found in many of the rock basins in the forest country farther south.

This great swamp covering the Littoral plain has an area of 60,000 square miles within the District of Patricia, and if the adjoining areas to the west, in Manitoba, and to the southeast, in Ontario and Quebec, are taken into consideration, it has a total area of about 120,000 square miles. This is undoubtedly the largest continuous swamp in America, and it is possibly the largest in any country in the world. In order to designate it with greater accuracy I would propose that it be known as *Archudsonian Swamp*, signifying that it was within the confines of the older and larger representative of Hudson Bay.

Small Pine and Spruce.

The gravel beach which extends along the shore in front of it, within the limits of the district of Patricia, is devoid of trees, while behind the beach there is usually a wet marshy belt, or perhaps a series of long shallow ponds. Farther back is another older beach, and on the second or third of these beaches the coniferous forest begins as a belt of white and black spruce of medium size. Behind this narrow coastal belt of timber the mossy plain begins and extends inland to the rougher upland country. Lakes are almost entirely absent, and the few that are said to exist are probably shallow ponds dammed up behind the old abandoned sea beaches. The absence of lakes, and the consequent scarcity of fish, makes it difficult for Indians to live in this swamp, so that the native population of Patricia is confined almost entirely to the Interior Upland Country. The lower layers of moss, and doubtless also the underlying ground, are frozen throughout the year, while the upper layers are in summer completely soaked with water, so that travel over it at that season of the year is practically impossible. From the surface of this soaking bed of moss small isolated black spruce and tamarack stick up like big bristles, while here and there, on small areas that for some reason or other are drier than those adjoining similar trees are collected together in small groves.

Absence of Real Timber.

On the banks of the streams which flow through or across this swamp the land is better drained than elsewhere, and here are usually narrow belts of tall straight timber, some of which may be 16 or 18 inches in diameter. There are other trees, such as the aspen and balsam poplar, on the river banks within this swamp, but nevertheless the only tree of any importance as timber is the white spruce. Although this Littoral belt, to which we have applied the name Archudsonian Swamp, must be classed as a forest country, the total quantity of valuable timber in it is small, and the average of the whole country would probably not exceed one or two cords to the acre.

The friends of Mr. J. Douglas Moir of Wm. Whitmer & Sons, Inc., will be glad to hear that he passed the crisis in a very accute attack of pneumonia on Monday, January 24th, at St. Luke's Hospital, Ottawa, Ont. Mr. Moir left New York on the sleeper on Sunday, January 16th to attend the 8th Annual Meeting of the Canadian Lumbermen's Association and was taken ill suddenly on the way up. He was conveyed from the Chateau Laurier to the hospital by ambulance shortly after his arrival. It will be the middle of February before Mr. Moir will be able to return to New York.

Private Timber Owners and Fire Protection

Better Allow Saw Mill or Paper Mill to Burn Than Neglect Insurance of Raw Materials.

By

Ellwood Wilson,

Forester, Laurentide Company, Limited.

Imagine the manufacturer with his whole stock of raw material for his lifetime piled up in one store-house. Would he have it insured? Would automatic sprinklers be installed? Would he have a watchman or so on the premises? Would you if you were that manufacturer? Let me carry the parallel a little further, and ask what you would do if you knew that the destruction of your stock of raw material meant the destruction of the elements from which it could be reproduced and the supply for your children and grand children.

The forest is such a store-house and on it depends our most important industries, the stability and continuity of our water powers, the welfare of our agricultural population, the comfort of our daily lives. The private timberland owner is just as vitally interested in fire protection for his woodlands as any manufacturer. He might far better let his saw-mill, his sulphite plant, his paper-mill go uninsured and spend the money in protecting his forests. In a year or two he can rebuild his mill, he can easily borrow the money for the purpose and go on just as before. But he cannot reproduce his forests. After a bad fire the soil itself is partially or wholly destroyed and if the fire has been of any extent the distance from the nearest source of seed may be too far away for natural reforestation to take place. Gentlemen, I have seen a tract of land of about ten square miles in extent which after fifty-six years has not a stick of merchantable timber on it although covered with a growth of small birch and aspen, which is already past its prime, and not only is there no merchantable timber but on this whole tract there are but 1,280 spruce and balsam trees not over three inches in diameter. The average percentage of burnt over land which is not reproducing in Quebec is 16% or about 10,597 square miles and that on which reproduction has begun is 12.9%. These figures are based on actual surveys over a large area and when applied to the areas under license rather under than over-state the amounts.

Piling and Burning.

One of the most important questions to be considered by lumbermen for the protection of their forests is an efficient and economical method of slash disposal. Top-lopping on operations where large amounts of timber are cut has proved in my experiments to be too ex-

pensive for the measure of protection it gives and I think the only solution will be in brush piling and burning. The cost of this will be very little more than for simple lopping as the brush has to be piled in any case, and the protection will be absolute. In my experience the great majority of fires originate in slashings and such fires cause the most damage and are the hardest to fight. If all woods operators are required to dispose of their slash it will be no hardship as it will put all on the same basis and the cost will be added to the finished product.

Would a farmer set fire to his wheat crop? What a question! Would he burn his seed wheat for years to come? Would he let his employees smoke if it endangered his crop? Would he allow hunters, fishermen and campers to freely travel over his land, making fires and scattering lighted tobacco from their pipes? Would he let his neighbor light bonfires where the fire would spread to his standing grain? He would not. Is he wiser, more practical, more hard-headed than the lumberman? Is he a keener business man? You will say no. But I can point to dozens of men whose bread and butter depend on their supply of raw material from the forest who do just such things and worse. I could multiply instances enough to make a volume.

Fire protection is not forestry any more than it is logging or milling, but is the foundation, the absolute essential of all these. Without it they cannot exist. If we are not prepared to protect our forest, in heaven's name, as practical men let us cut them down and use them up before they are burnt.

Fire protection is not a matter of cost, it must be done as cheaply as possible but it must be done at any cost.

The Interest of Stock-holders.

Remember, in Canada we are not dealing with privately-owned forests but with government owned ones; they are the property of the people; every man, woman and child has a direct interest in them which extends to generations yet unborn. It is the duty of our public servants to see that they are protected and that the licensees, who are but tenants, should not be allowed to shirk their responsibilities. Quebec is the only province in Eastern Canada to fully realize this and its fine of $5.00 per square mile for the licensee who fails to properly protect his limits has done much good. The average man does not realize how closely fire protection touches him. Every stock-holder of timber-owning companies should take an interest in fire-protection and see that his directors are taking care of their forests. Bond-holders are vitally interested, as a good part of their security may be wiped out in one large fire. Banks should not loan money on timber limits as collateral until they have investigated the fire prevention provided by the borrower. Don't trust any concern which does its own fire protection, unless it is done by a department which has no other duties. The timberlands departments have too many other duties, they have men they want to "take care of" from one season to the next, from the end of the drive to the beginning of the fall cut. They leave their patrol to cache-keepers, dam-keepers, and if there is any exploring, any repairing or other odd jobs, fire rangers are taken off to do them. Then too it runs up the logging cost and you all know what a terrible thing that is. Fire protection is a business by itself. It requires special knowledge, special training and special tools and methods and the man who is killed in logging or driving is not necessarily a good fire discoverer or fighter, rather the reverse. The same thing applies to railroad fire-fighting which is usually left to section crews. These men have other work to do and many of them do not take

any interest in the fire protection work. It would pay the railways and be far more efficient to have special fire patrolmen under a separate department head. The reduction of damage claims would pay for the expense many times over. Just as volunteer fire-fighting is out of date, so is amateur forest fire protection. A maintenance-of-way department grudges every cent spent on fire protection and this attitude filters down to the section men.

Waiting for Rain.

All your work for conservation of our timber resources is wasted if we cannot conquer the fires. When I first went into the woods in Quebec, I was told one day that there were fires all along a river. "Why don't you put them out or prevent them," I asked. "Oh, you can't help having fires, it is impossible to put them out. We'll get rain pretty soon." But this attitude has changed and the outlook is very hopeful. The first real attempt at fire protection was made in 1908 and now after eight years we have 38.5% of the licensed area of the Province under efficient co-operative protection, and this protection is becoming more and more efficient each year. Co-operative fire protection is not only more efficient, but it is much cheaper than individual protection. It is costing the larger members of the association only two-thirds of what it cost them to protect their own limits and has wiped out the menace of the small limit-holder who never used to protect his territory. If a man owns fifty square miles, it would require two men for six months with their outfit of canoe and tent and provisions at a minimum of $500, to patrol it, or 1.6 cents per acre, and he gets much more efficient service for ¼ of a cent per acre.

The Quebec Department of Lands and Forests, under Hon. Mr. Allard, Mr. Dechene and Mr. Hall, deserve the highest praise for the work they have done in helping along this movement, showing thereby their board-mindedness and their sense of responsibility for this great provincial asset placed in their care. In every way they have helped, often at political inconvenience to themselves from members of Parliament trying to save their constituents from punishment for infraction of the fire laws and others who did not want to spend any money in protecting their limits. Mr. Allard is now at work on amendments to the Provincial fire laws which will bring them up to date and make them easier of enforcement and do away with some abuses. The settler and the woodsman living so in the wilderness has naturally become ignorant of the law and contemptuous of it, but this condition is rapidly changing for the better.

The Government Loses.

Of the 70,000 square miles of timber limits under license in Quebec about 10,000 square miles are burnt and have not yet commenced to reproduce themselves. At an average of 2,500 board feet per acre, this means a loss to the government of $15,000,000 in stumpage dues and for the 8,500 square miles reproducing, but which will not be ready to cut for 50 years, a large loss of revenue due to the interest for this long period. When licensees awake to the fact that they are paying the Government $5.00 per square mile per annum for lands from which they cannot get a cut, or at least not for fifty years, and release these limits to the Government, the loss of revenue will amount to $90,000 a year.

The agitation for better fire protection has also resulted in closer utilization. Burnt timber never used to be cut but now the larger companies cut all the trees on burnt-over land and the Government encourages this by a reduction in the stumpage dues, thus saving a great waste.

Education Needed.

The great necessity is education of all classes of our people—the man in the street, the government officials, members of parliament, lumbermen, business men, woodsmen, farmers, settlers, and hunters, and above all the children, for they will be the men of the coming generation; and often the only way is to educate the children. The church in the Prvoince has done splendid work. His Eminence, Cardinal Begin, Archbishop Bruchesi, and Monsignor Laflamme have for years sent special notices to all their parishes to impress upon their people the necessity for care. The Department of Education, through their inspectors, have distributed leaflets to the schools in both languages, showing by pictures and by simple sentences the danger of forest fires. The reduction in the number of settlers' fires has been remarkable and once the laws are enforced they will be a thing of the past. Members of parliament are especially in need of instruction, for several times they have encouraged their constituents to fight arrest and have influenced the magistrates, tried to use their influence at Quebec, and have even paid the fines themselves. The magistrates have been very remiss in their duty in some districts, discharging offenders in spite of clear evidence and imposing fines of $1.00, making thus a mockery of the law they are sworn to administer.

Menace of N. T. Railway.

The railways, with one notable exception, have had a decided change of heart and railway fires of any seriousness are rapidly becoming a thing of the past. The N.T.R. and I.C.R. are an exception to this and are to-day a menace to the forests of the Province. Although the Honourable Minister of Railways and Canals promised to put into effect the same regulations as those in force on the railroads under the railway Commission and issued an order to that effect, his heads of departments have not enforced his orders in Quebec and have as yet made no provision for adequate protection. Since these lines run through country which will give them no other freight but timber, they should, even from a selfish standpoint, protect these sections. The Quebec Government has done all in its power to get this matter settled, but has had no satisfaction.

Workers in the woods are still in need of education, as ten per cent. of the fires are still set by drivers. Woodlands Departments are getting more strict, and setting a fire is now in the most progressive companies cause for instant discharge of the man and punishment for the foreman.

Stricter Laws Coming.

The proposed amendments to the present law approved by Mr. Allard, and the better enforcement of the fire laws, will be a great step in advance. These changes will require permits to burn clearings at any time during the summer, will require all persons called on by a fire-ranger for help in extinguishing fires to respond under penalty of a fine, will fix minimum fines for infractions of the laws so that a magistrate cannot make the law ridiculous by letting a man off with a one dollar fine, and will punish by imprisonment any deliberate setting of fire to get employment in extinguishing it.

There is a great need for better methods of slash disposal and I believe that the only right method is the piling and burning of the branches and tops as soon as the trees are felled. A fire in a slashing is terribly destructive and almost impossible to fight, and if there was no inflammable material of this kind, fires, except in unusually dry seasons, could never assume dangerous proportions and could be easily extinguished.

The greatest advance in fire prevention methods will probably come

in a year or two, through the use of aeroplanes or hydro-aeroplanes. One of these was used last summer by a volunteer fire-fighter, Mr. Vilas, with great success. The initial cost is high, about $7,500, or, with the duty, about $10,000, but two men with one machine could patrol 10,000 square miles and, being able to see a fire in its first stages, they would be able to extinguish it without calling for extra help.

"All Were for the State."

We have still much ignorance and inertia to overcome, but the advances in the past few years have been varied, and if our people will but realize that there is a patriotism of peace as well as of war, and that slackers in peace time are as contemptible as in war, and when we shall realize our full duty as citizens and impress on government officials that they are but public servants and their offices are offices of trust, when we realize the words of Macauley, "None were for the party but all were for the state," then we shall look back on forest fires with wonder at the civilization which tolerated them.

The foregoing paper was read before the Commission of Conservation at their annual meeting, January 18th.

B.C. Market Prospects

Hon. W. R. Ross, Minister of Lands,: "With our timber supply, sawmill capacity, rapidly improving Canadian markets and a foreign market shown by recent investigations to be full of promise, there is little room for pessimism in regard to the future of our lumber industry. There are, however, serious obstacles to be overcome before permanently prosperous conditions can be secured, and strong co-operative effort is essential. A good beginning has been made in 1915, systematic advertising of our forest products having been undertaken and a commercial service in the Prairie, Eastern and United Kingdom markets having been initiated. There has been considerable development of the spirit of co-operation among the lumbering interests of the Province.

The year 1916 will see the great problem of ocean transportation attacked with vigor. I look forward to remarkable progress being made by the lumbering industry before this time next year."

Trees for Soldiers' Graves

To Editor, Canadian Forestry Journal:—I should like to "air" the following suggestion. The war has now lasted seventeen months, and during that time, side by side with other Empire troops, Canadian soldiers have performed immortal deeds. It is not a good sign of appreciation, however, that not a single city of the Dominion has yet come forward with proposals for commemorating such deeds. If they ever do, it will be something in cold stone, bronze or iron!

It is timely to suggest, through the medium of the Association the planting of maples for Langemarck, and other species for Neuve Chapelle and Ypres, also Festubert. Such a suggestion may draw attention to the sad neglect of tree planting by municipalities who in the West destroy rather than create, the smaller bodies being the chief offenders. A typical business section, with gaunt stores and office blocks, devoid of a single tree to break the monotony is a sad sight, especially when one remembers that in all probability shade trees were cut down to make room for business houses. Yet in London (Eng.) the trees are prominent, except in the heart of the city itself, and even then there is an occasional oasis, some open space planted, and much appreciated by men and birds.

Victoria, B.C. A READER.

The Success of Co-operation in Forest Protection

In Past Four Years, the St. Maurice Association of Limit Holders Has Made Splendid Record.

By

S. Lawrence de Carteret,

President, The St. Maurice Forest Protective Association of Quebec Province.

Preparatory to discussing the work of the St. Maurice Forest Protective Association a short summary of the conditions existing previous to its formation will not be out of place.

Formerly each limt holder obtained appointments as fire rangers from the Department of Lands and Forests, for such men as he deemed necessary for the patrol of his limits. Naturally he desired to protect his timber but at the same time wished to eliminate any avoidable expense, hence the majority of the men appointed as fire rangers were woods and drive foremen, woods clerks, cache keepers and dam tenders, improvement gang foremen, scalers, &c. To the most of these men fire ranging was a secondary occupation which they considered of minor importance, consequently an efficient patrol was a minus quantity.

Individual Efforts Fail.

With the location of a new Transcontinental railway through the heart of the territory came the menace of fires resulting from construction gangs, steam shovels and work trains. Settlers located in and near the limits had long been a source of danger, and as new townships were opened up along the new railway their number increased. Disastrous fires resulted from all these sources, Some of the limit holders affected thereby increased their efforts to cope with the increasing fire danger, others took their losses as inevitable, and the inadequacy of scattered individual action was plainly evident.

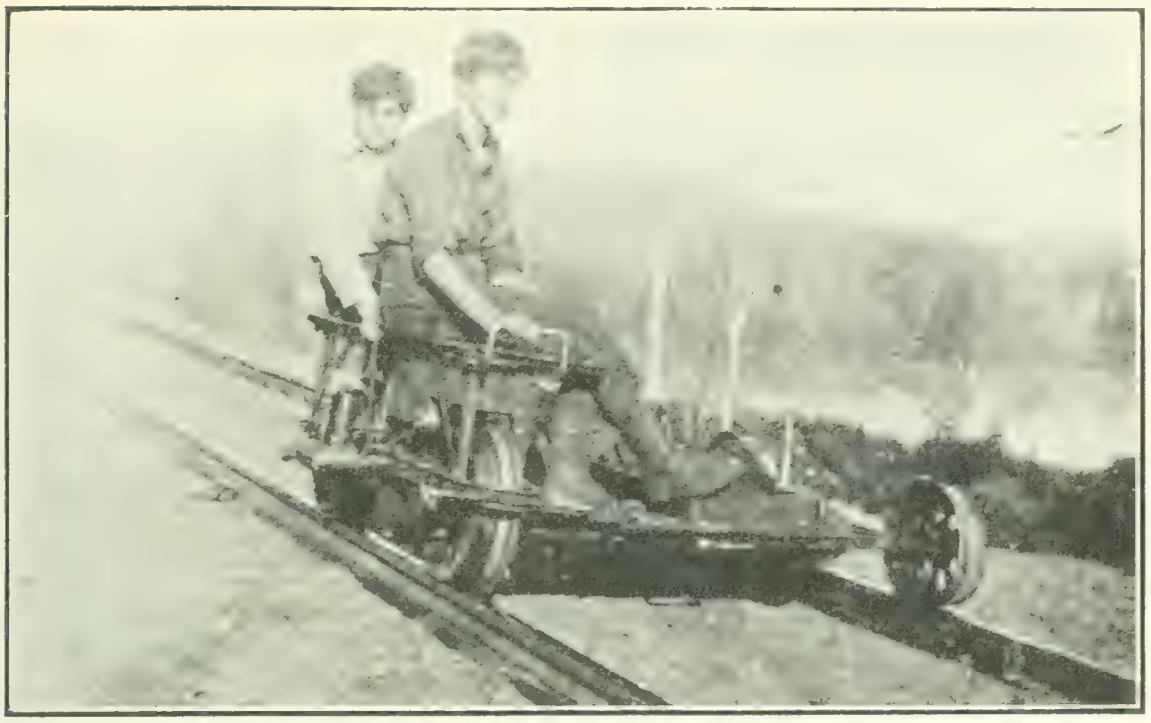
Since 1903 the lumbermen of the St. Maurice Valley had driven logs on a co-operative basis and between 1908 and 1911 some of the owners of limits along National Transcontinental Railway had conducted a successful patrol of the right of way, so the co-operative idea was not new.

These then were the conditons leading to the desire for better protection for the limits as a whole regardless of ownership lines. In the latter part of February, 1912, a number of the limit holders in the St. Maurice Valley decided to invite all the owners in the Valley to join together in the formation of a co-operative forest protective association.

Association's Objects.

This was consummated when on March 2nd, 1912, sixteen timberland owners, whose holdings totalled over seven million acres, united in organizing the St. Maurice Forest Protective Association, its chief objects being as follows:—

To organize and establish an efficient system of fire protection, em-



Motor-Speeder Railway Patrol in the territory of the St. Maurice Forest Protective Association, Quebec Province.

bracing all the timberlands of the St. Maurice Valley and adjoining territory; to fight and extinguish fires; to construct look-out stations, telephone lines, trails, &c., necessary for efficient patrol and the apprehension of fire; to prosecute transgressors of the fire laws; and to promote legislative and educational measures advocating the conservation of forest resources.

On the 20th of March a manager was appointed who submitted a working plan and estimate of cost to the Directors of the Association on the 6th of April and the fire patrols commenced actual operation during the first week of May.

Thus in the short space of nine weeks an Association comprising 16% of the lands under license in the Province was organized and its work started over the entire territory.

The affairs of the Association are controlled and managed by a Board of Directors, and the funds necessary to defray the expenses of the Association are raised by assessment which is based on the acreage holdings of the members.

The Association assumes for its individual members all the obligations of fulfilling the fire protective regulations of the Government.

It also carries on the fighting of fires occuring on the lands covered by its operations and the expense incurred in so doing is assessed pro-rata on all the members of the Association in proportion to their acreage holdings.

Over 12,000 Square Miles.

The present area patrolled, exclusive of Government lands not under license and settled districts, is 12,332.46 square miles, or 7,892,776 acres.

This area is divided into six divisions each in charge of an inspector, these divisions being further sub-divided into thirty-two districts or patrols, seventeen of which are patrolled by men in canoes, seven by men on horseback, three by men on foot, one by man in look-out station, and four railway patrols by men on motor cars.

During the past season eighteen special rangers were put on the drives and with construction crews.

It is the duty of each inspector to keep in close touch with each ranger in his division and to give him personal assistance when necessary.

The size of the districts is determined by taking into consideration the nature of the country, the extent of logging operations and the number of settlers therein, and the consequent liability of fires resulting therefrom.

The rangers are required to make out reports of work done each day. During wet periods they cut trails and portages where necessary.

While on inspection trips the inspectors collect the rangers' weekly reports and forward them with their own to the office of the Association, and from these reports are compiled the statements required by the Government.

In 1915 the distance travelled by forest patrols was 67,563 miles.

Five Motor Cars Used.

The Association patrols 167 miles of the National Transcontinental Railway. In this part of the work five motor cars are used, four in continuous service on regular beats, the fifth being kept in case of emergency.

This method has been found far superior in efficiency as well as in cost to the old system of patrol with hand velocipedes. Engine screens and fire pans are regularly inspected and necessary repairs called for. The distance travelled by railway patrols in 1915 was 41,390 miles.

Joining Hands with Settlers.

During the season of 1914 an endeavor to govern the burning of settlers' clearings with a permit system was made and with such success in certain districts that early preparations for the same procedure were made in 1915.

During the month of March letters were sent to the Cures of the different parishes asking them to announce from the pulpit that the Association wished to co-operate with the settlers in disposing of their slashings.

Early in April, while there was still snow in the woods rangers were sent through the settled districts to issue burning permits to those whose slash was ready, and to encourage the others to prepare their slashings for burning under the supervision of the rangers through the permit system.

During the season 628 burning permits were issued and not one of the burnings started under the system got beyond control.

That burning permits and the attendant supervision by the rangers have greatly reduced the number of settlers' fires in the Association's territory is evidenced by the fact that in 1913 there were 151 fires from this source, 1914, 80, and in 1915 only 41.

Lookout Towers.

The topography of the country is such that in general it is difficult to locate observation points of range extended enough to warrant permanent watchmen. However twen-

One of Manager Sorgius' experienced fire rangers setting forth on his patrol.

ty-three lookouts have been erected, the majority of which are frequently used by the rangers when in the vicinity on their regular beats. Good trails have been cut to all of them with the idea of connecting them with the nearest telephone lines. At the present time there is over four hundred miles of telephone line in the territory the greater part of which has been constructed by the individual members of the Association.

Tools for fighting fire have been deposited in thirty different locations, each set averaging about three dozen implements composed of axes, mattocks, shovels and pails.

In the past four years 63,000 fire notices and signs have been posted and 22,000 leaflets and booklets distributed.

In the same period over 800 fires were extinguished, over 80% of which were put out by the rangers themselves without outside assistance or extra expense, all of which is proof of the excellent work of the manager and his organization.

Opportunities are numerous for the formation of similar Associations, particularly in the Upper Ottawa and on the Saguenay waters and it is sincerely hoped that in the near future the number of protective Associations will multiply in this and the other Provinces.

The paper, which is partially reproduced in the foregoing, was read at the annual meeting of the Canadian Forestry Association.

Ruining the Trees

(Ottawa Free Press editorial referring to a protest against civic vandalism in which an Ottawa woman lost several fine elm trees):

In the light of knowledge of the way in which such things have been done in the past, we are inclined to accept the statement of Mrs. Butler, in preference to the contradiction of

Ranger posting fire signs.

civic officials, that there was no necessity for the cutting down of the elm shade tree in front of her home in Kent street. Also, on the assumption that the man who will needlessly destroy a shade tree in a city street will do other uncouth things, we are prepared to believe the assertion that the "city gardener" met Mrs. Butler's protests against the tree vandalism with rudeness and impertinence. City Engineer Askwith must have a sense of humor when he refers to the man whom he sends about the city to cut and hack the fine old trees lining the streets as a "gardener." Judging from the way in which great limbs have been ruthlessly hacked from the maples along Metcalfe and other streets, "butcher" would be a more fitting terms.

(Published in Collaboration with Canadian Society of Forest Engineers.)

"There are foresters whose vision sticks in the woods and does not pierce through to the fact that the welfare of the people, not the welfare of the community of trees, must be the aim of the forester's endeavor. Forests are only the medium through which he works. The most successful forester is the one whose life and work contribute most fully to the necessity, convenience and pleasure of the greatest number of people, not necessarily the one who grows the most wood per acre in the shortest time."—DuBois.

The annual meeting of the Canadian Society of Forest Engineers was held in Ottawa on Tuesday evening, January the eighteenth, at the Laurentian Club. Mr. R. H. Campbell entertained the members of the Society at dinner after which the business meeting was called to order by the President, Mr. Clyde Leavitt. The guests of the evening were: Messrs. Bates and Kynoch, of the Dominion Forest Products Laboratories at McGill University, and Robson Black, Secretary of the Canadian Forestry Association. Mr. A. G. Gutches, Director of the New York State Ranger School at Wanakena was one of the American members of the Society present.

The members attending the meeting were, Dr. B. E. Fernow, Dean of the Forestry School of the University of Toronto; R. H. Campbell, Director of the Dominion Forestry Branch; E. J. Zavitz, Provincial Forester of Ontario; G. C. Piche, Chief Forester of Quebec, and Head of the Laval Forest School; Clyde Leavitt, Chief Fire Inspector to the Dominion Railway Commission, and Forester to the Conservation Commission; Messrs. Finlayson, Dwight, Cameron, Wallin, Roberts, Dickson, of the Dominion Forestry Branch; L. M. Ellis, of the C.P.R. Railway; Prof. W. N. Millar, of the University of Toronto; Prof. R. B. Miller, of the University of New Brunswick; N. M. Ross, Dominion Forest Nursery Station, Ellwood Wilson and Arnold Hanssen, of the Laurentide Co., Limited.

The Secretary's report showed the Society to be in a growing and flourishing condition; eighteen new members have been added in the past year, Quebec and Maritime Provinces showing the greatest number of new members. The total membership is now eighty-seven.

The Society lost a valued member by the death of Mr. Abraham Knechtel, Forester of the Dominion Parks Branch. It was decided to issue a monthly news-letter to the members and also to publish a history of the Society. A new caliper for measuring trees, the invention of one of the members, was shown. R. H. Campbell was elected Chairman of the Ontario Executive. Two members of the Society were honored this year, George Chahoon, Jr. was elected President of the Laurentide Co., Limited, to succeed the late Sir William Van Horne, and P. A. Sabbaton was elected Vice-President of the Laurentide Power Company, Limited.

An informal and very interesting discussion on the Forestry Situation

in New Brunswick, was the feature of the evening, expert opinions being given as to what the needs of the Province were and how they could be carried out in the most practical and economical manner. The announcement was also made that Mr. P. Z. Caverhill, a member of the Society, had been chosen as Director of Forest Surveys for the Province. Discussion of the best methods for such a province-wide survey and the ends to be attained were carried on by Messrs. Leavitt, W. N. Millar, R. B. Miller, Dwight, Ellis, Roberts and Wilson.

It was reported that about fifteen per cent. of the Society's membership was either at the front or had enlisted, a showing which probably cannot be equalled by any other profession.

After a very enjoyable evening and a vote of thanks to Mr. R. H. Campbell, the meeting adjourned.

University of New Brunswick

Dr. Jones and Prof. Miller were in Ottawa, January 18th, 19th and 20th, the former attending the sessions of the Conservation Commission and the latter the annual meeting of the Canadian Society of Forest Engineers and the Canadian Forestry Association.

An interesting letter has been received from Robert K. Shives, of the class of 1913, who is now with the Royal Flying Corps, Panmure Barracks, Montrose, Scotland. Shives is enjoying the work and is getting to be an expert in the plotting of sky topography, cruising, and taking elevations with the aneroid.

Hayward Kinghorn, of the class of 1911, formerly Forest Assistant at Hazelton, B.C., was here during the holidays, leaving in company with Bruce Dixon to enlist at Montreal, probably going from there to take a qualifying course in artillery at Kingston. Harold C. Belyea, also of the class of 1911, was here on January 3rd on his way to New Haven where he will this spring complete the work for his Master's degree in Forestry at the Yale Forest School.

Mr. James Smart, lately from Kamloops, B.C., of Lachine, Quebec, is taking a special course in Forestry to more fully equip himself for work with the Dominion Forestry Branch with which he has been engaged for the past three years in the construction of trails and telephone lines, and other practical work.

The Junior class suffers in the loss of Miles Gibson and Chris Armstrong who are taking a qualifying course at Kingston.

C. E. Maimann, R. D. Jago, James Burns, Leland Webb and J. Edwin Hall, of the Senior class in Forestry, spent the Christmas vacation in office work with Mr. Reginald R. Bradley, of St. John. Robert Melrose, a special student of last year, was also in the same party.

Use Canadian Woods Only

In order to encourage the use of Canadian hard-woods for interior decoration, Lord Shaughnessy has issued instructions to use nothing but Canadian forest products in the sleeping, parlor, dining and observation cars in the offices and hotel buildings of the Canadian Pacific Railways.

This decision was made only after careful consideration and experiment. Lord Shaughnessy has had samples of all Canadian hardwoods treated at the Angus Shops in Montreal, where selected specimens were tested with polishes, stains, etc., and the results showed that Canadian woods compared very favorably with imported varieties.

The Annual Meeting

450 New Members Joined—Revenues Increased—"Contributing Memberships" Added to Constitution—Excellent Addresses on Variety of Topics.

Lt.-Col. J. B. Miller, President of the Polson Iron Works, Toronto, elected President of the Association for 1916; Hon. Sydney Fisher, Vice-President. New Directors: Alex. MacLaren, F. C. Whitman, and Albert Grigg, Deputy Minister of Lands and Forests for Ontario. New Territorial Vice-Presidents: Hon. T. C. Norris for Manitoba, and Hon. Walter Scott for Saskatchewan.

The Constitution of the Association was amended to permit of a new classification of membership, known as "Contributing," the annual fee for which was placed at five dollars. The Annual Membership retains the same status as formerly, the fee being one dollar. The Life Membership was raised from ten dollars to twenty-five dollars.

The attendance was large at both morning and afternoon sessions.

An illustrated lecture on "Closer Utilization of Forest Products" was given during the afternoon by Hon. W. R. Brown, President of the New Mampshire Forestry Commission; "The Work of the St. Maurice Forest Protective Association" by S. Lawrence de Carteret; "Forestry and the Future" by R. H. Campbell, Director of Forestry; "Forestry Work in Ontario" by E. J. Zavitz, Provincial Forester of Ontario; "Forestry and the Lumber Industry" by W. T. Van Dusen, of the B. C. Forest Service.

A Joint Banquet was held with the Canadian Lumbermen's Association, Commission of Conservation, and Canadian Society of Forest Engineers at the Chateau Laurier, January 19th and was regarded as a highly successful event.

While not assuming the dimensions of a convention, the annual gathering of the directors and members of the Canadian Forestry Association on January 20th, at Ottawa, extended the usual brief programme of business into an all-day session, with several special addresses on important topics. The meetings proved of keen interest to the audiences which throughout the day were uniformly of good size. The large convention room, loaned for the occasion by the Chateau Laurier, proved ideal for the purpose. About the walls were built up special exhibits by the Forestry Branch, including an elaborate display by the Forest Products Laboratories, by the Entomological Branch, the U. S. Forest Service (which kindly loaned a set of model forests illustrating "good and bad lumbering"), and exhibits of other organizations. These

Lt.-Col. J. B. Miller, Toronto,
President of the Canadian Forestry Association, 1916.

provoked uncommon interest, and no less with the lumbermen who held their annual meeting in the same room on the previous day.

All the provinces were well represented in the attendance when the President, Mr. F. C. Whitman, called the meeting to order at 10.30 o'clock.

The President's Address.

The President's address referred to the series of disturbing influences upon the Canadian lumbering and allied wood-using industries during 1915. They had felt keenly the general business sentiment of extreme caution, and on the other hand were not singled out, as with some other industries, for a temporary boom on war orders. The state of the market for our wood-using industries was of the utmost concern to the cause of forest conservation. Radical reforms in lumbering customs would be deemed impracticable until stumpage values were increased, and that could come only through higher prices for the finished product or decreased costs in logging.

Mr. Whitman spoke of the probable effects of the war on the demand for Canadian forest products. Destruction was proceeding in the belligerent countries at a pace quite regardless of future needs. Military necessities had superseded every other consideration. Without doubt, the close of the war would force European countries to look to North America for a great part of their wood supplies. The war and its visible effects, therefore, constituted an irresistible argument in favor of forest conservation in this country. If we are to take full advantage of the national opportunity and responsibility coming after the war, it could not be done by the present policy of throwing into the bon-fire several times the amount of timber we cut annually for our use.

The President referred briefly to the lightness of the fire risk in 1915 in Eastern Canada and on most of the Pacific Coast, and spoke of the losses caused in Manitoba by carelessness on the part of the builders of the Hudson Bay Railway. Of the work of the Dominion Forestry Branch, he observed:

Exploration Works.

"The Dominion Forestry Branch has continued its exploration of the timbered areas of the western provinces under its jurisdiction in order to ascertain the location of the bodies of timber and the lands which should be permanently kept in forest. I understand that this work has progressed so far that within another year or two the whole of the forested districts will be covered and that it will be possible to make a general survey of the timber resources and make final plans for protection. The information obtained so far adds to the evidence that the mature timber in our northern forests is not by any means continuous in stand, and in fact forms only a small proportion of the stand, and that the protection of the young growth is of the greatest importance if our timber supply is to be kept up. The past season varied very much in different parts of the west. In the southern agricultural districts of the prairie the rainfall was regular but in the northern range of the forest the season was particularly dry, resulting in very many fires and some loss of timber.

"The organization of the Dominion forest reserves is being improved steadily and the efforts of the staff at protection are very much assisted by the scheme of improvements which has been laid out and is being constructed on the reserves. A few more years will have completed the work sufficiently to give almost a complete control of the fire situation.

Tree Planting on Prairies.

The farmers in the prairies in the West are showing their appreciation of the value of the planting of trees on farms by making application in

increasing numbers each year for trees, from the Dominion Government nursery, and the success of the plantations is generally remarkably good. It is understood that a stock of trees is also being grown at this nursery station for the re-planting of the denuded areas of sand lands which occur at places throughout the western prairies and which have recently been almost all included in forest reserves. The value of a stock of timber in the middle of an open prairie country is almost beyond computation.

"It is a matter for congratulation that the Dominion Government has established a division for the investigation of Canadian timbers and their uses. The investigations of this division will give information that will make possible developments in industries using wood products which should assist Canada materially in making and retaining her proper place as one of the great wood producing countries of the world.

The success of the two co-operative forest protective associations in Quebec was, said Mr. Whitman, a matter of gratification.

Directors' Report for 1915.

The work of the Canadian Forestry Association in 1915 was carried on during the months of January, February, March and half of April by Mr. Lawler, and during the eight and a half remaining months by the new Secretary, Mr. Robson Black.

In the belief that aggressive publicity in the cause of forest conservation fulfills one of the first objects of the Association, the Secretary began on April 15th a campaign through Canadian newspapers and magazines which gradually extended in scope until at the close of the year most of the publicity measures that can be used in the conservation cause were already in effect or in process of inauguration. The Association is now allied with several hundred newspapers and magazines, with picture theatres, Boards of Trade, farmers' clubs, women's institutes, educational institutions, banks, railways and other channels for reaching the general public, and this alliance is in the truest sense a working one, and already found to operate satisfactorily.

It is particularly worthy of note that wherever the Secretary has asked for an opening for the presentation of the claims of forest protection and conservation generally the response has been invariably hearty. This applies with equal truth to editors, educationists, club officials, society organizers, theatre owners, church authorities, etc., in all parts of the country. The campaign conducted by the Association may have an enormous amount of public ignorance and indifference to overcome but it is not additionally handicapped by any resentment or widespread prejudice.

A forward move was made on November 1st by the engagement of new and larger offices in the Booth Building and the securing of additional office assistance. These new facilities give the Association an up-to-date equipment which is showing its value in the work from day to day.

As to the character of the publicity matter, a few words may be said. Probably two-thirds of the articles and illustrations dealt with the evils of forest fires and traced their damage back to the pockets of the individual reader. Forest fires were made a matter of personal loss in nearly all newspapers and magazine material, and wherever possible

statistics were given to demonstrate the point. Another line taken was to connect the revenues from forest operations with employment and wages and supplies. These and other practical and popular reasons for forest protection were freely circulated.

Growth of the Journal.

Another channel of publicity has been the Canadian Forestry Journal. This was enlarged from 16 to 32 and recently to 48 pages, and although the cost of the latter sized issue was in excess of the 16 pages, the assurance of new advertising for the larger magazine justified the expense. The monthly contents now consist of eight or nine articles specially written by competent authorities and are quoted freely by many of the two hundred editors included in the mailing list. The enlarged Journal has been found of excellent value in attracting new members to the Association.

In order to inform himself at first hand, the Secretary made journeys to Lachute and Berthierville, Quebec, St. Williams, Ont., Montreal, Toronto, the limits of the Lower Ottawa Forest Protective Association and other places where information was secured.

Plans were completed early in the Fall for the distribution of special forms of illustrated literature to classes of people whose co-operation the Association desired. Thus, all the Canadian Banks, the Railway Companies, Forest Branches and other organizations undertook at the Secretary's request to allow the services of their branch managers, agents, and other officers to deliver special booklets direct to settlers, river drivers, section men, farmers and others. So faithfully were these arrangements carried out that scores of local officials reported direct to the Association or to their head offices that books and bulletins had been handed to persons for whom they were intended and in some cases enclosed a detailed list of the recipients.

Reaching Special Classes.

In development of this plan, 20,000 booklets bearing on the cover a colored imprint of the forest ablaze were printed in English and French and sent to most of the forested districts of the Dominion and there distributed. The Quebec Government printed a further edition of this booklet at its own expense.

Ten thousand illustrated booklets for school teachers and young people, called "Twenty Canadian Trees" were issued and carefully distributed, the demand from school children showing no abatement even months after the first newspaper comments.

Sixteen thousand small books of thirty-two pages, sixteen of the pages containing photographic illustrations, were issued for the Boy Scout Movement under the title of "The Boy Scout Forest Book" and these will be delivered to local scout masters from the central executive in Ottawa. This booklet told boys about the forest from the angle of its industrial and other importance, showed them what the water-shed forests mean to the rivers, how forest fires are started, how fought, and other information calculated to stir up a new sort of interest in timber areas.

Circuits of motion picture theatres were lined up for a 1916 campaign with forest fire lantern slides. A trial was made of these slides in Ontario, Manitoba and New Brunswick during 1915 with very favorable reports from local persons.

The newspaper cartoon has been another device adopted by the Association for its purposes. Nothing conveys a point in such short time or so forcefully as a good cartoon. During December, eighty of these were distributed by the Association to newspaper editors and, if the finances permit, the cartoon will be used regularly as a part of our campaign machinery.

The lecture programme of the winter of 1915-16 was commenced by the Secretary at Shawbridge, Quebec, and will be continued at other points. Requests from distant communities for lectures on forest questions brought about a scheme of ready-prepared lectures in which authoritative material in lecture form will be sent to local speakers together with fifty lantern slides, illustrating the subject sufficiently. Many demands for this ready-prepared lecture have been received and sets will go out before the end of January. The idea has been further extended so as to cover simple stories for school-children which will be sent out to teachers with small albums of photographs to pass about the class-room.

Co-operating with Boards.

Seventy Boards of Trade in Ontario have been brought into touch with the Association through an effort to interest them in the forest protection policies of that province and to secure their endorsation of the most modern laws and administration that can be introduced. The Board officials and their members were given information as to the importance of protecting the raw materials for forest industries in that province, and these matters with formal resolutions will be brought up at many of the annual meetings in 1916. This plan of interesting powerful public bodies in campaigning for specific points is capable of great extension and will be used in other parts of the country as freely as opportunity offers. Women's institutes and clubs, farmers clubs, etc., have been interested by the Association in the same department of work and results may shortly be expected.

Another form of co-operation has been with the Cardinal-Archbishop of Quebec who has given the Association's proposals kind consideration and has responded with assurances that the clergy in the parishes would further instruct the people in the facts of forest protection.

The Association has also endeavored to be of use to the two co-operative forest protective associations in Quebec by arranging thrugh their mangers for the prompt reporting of all prosecutions of settlers. These prosecutions were made into newspaper articles, French and English, and circulated through the large dailies and weeklies in most sections of Quebec province. In this manner the effect of the prosecutions was greatly increased.

Adding New Members.

A continuous effort was exerted to bring in new members. The result was that 450 Canadians joined the Association and practically all of this gain came between the first membership campaign at the first of August and the close of the year. Forty-five members were lost to the Association during the year, mostly through death or enlistment for the war or removal from localities without trace of their new addresses. Undoubtedly the efforts to secure new members would have added a much larger number had it not been for the disturbance of normal public interest through war conditions.

The funds of the Association, although subjected to new expense by reason of the enlargement of the programme were increased by the additional membership of $450 within the year. In addition to this, the Secretary commenced the organization of a new fund in December for the support of the Association's work and at the present time is able to report that amounts have been paid in or promised by individuals and corporations reaching $600 in hundred-dollar contributions. The development of this new fund will be carried on during 1916.

The Treasurer's Report

1915 RECEIPTS.	
Balance from 1914	$ 606 19
Membership fees	2271 44
Advertising	207 35
Interest	48 19
Manuscript	3 00
Grant from Dominion Government	2000 00
Grant from Quebec Govment	300 00
Grant from Ontario Govment	300 00
Pamphlets sold	7 25
Refund	4 00
Cuts	3 00
Publicity subscription	100 00
Compensation for moving office	35 00
	$5885 42

1915 EXPENDITURE.	
Salaries	$1873 60
Journal	1162 32
Secretary's Expenses	260 00
Postage	240 00
Commission on cheques	13 46
Printing and supplies	564 27
Miscellaneous	18 00
Publicity	27 38
Services	248 75
Telegraph	4 58
Office	11 75
Lantern lectures	21 79
Balance	1439 52
	$5885 42

Ottawa, December 31, 1915.

Election of Officers.

The Nominating Committee, composed of Messrs. Wm. Power, M.P., R. H. Campbell, and G. C. Piché, reported as follows:

President: Lt.-Col. J. B. Miller, Toronto; Vice-President: Hon. Sydney Fisher, Ottawa; Secretary: Robson Black; Treasurer: Miss M. Robinson.

Territorial Vice-Presidents: Ontario, Hon. G. H. Ferguson; Quebec, Hon. Jules Allard; New Brunswick, Hon. Geo. J. Clarke; Nova Scotia, Hon. O. T. Daniels; Manitoba, Hon. T. C. Norris; Prince Edward Island, Hon. J. A. Matheson; Saskatchewan, Hon. Walter Scott; Alberta, Hon. A. L. Sifton; British Columbia, Hon. W. R. Ross; Yukon, Geo. Black, Commissioner; Patricia, Sir D. C. Cameron; Ungava, His Grace, Mgr. Bruchési, Archbishop of Montreal.

Directors: F. C. Whitman, Wm. Little, Hiram Robinson, E. Stewart, W. B. Snowball, Thomas Southworth, Hon. W. C. Edwards, Geo. Y. Chown, John Hendry, Hon. W. A. Charlton, Wm. Power, M.P., Hon. W. J. Roche, Sir Geo. H. Perley, Alex. McLaren, R. H. Campbell, Gordon C. Edwards, Dr. B. E. Fernow, Ellwood Wilson, Senator Bostock, G. C. Piché, Alex. MacLaurin, Mgr. Roy, A. P. Stevenson, Wm. Pearce, C. E. E. Ussher, Denis Murphy, C. Jackson Booth, Sir William Price, Lt.-Col. J. W. Harkom, A. S. Goodeve, W. C. J. Hall, J. S. Dennis, J. B. White, E. J. Zavitz, Geo. Chahoon jr., R. D. Prettie, Hon. N. Curry, A. C. Flumerfelt, H. R. MacMillan, Clyde Leavitt, Albert Grigg.

Enlarged Classification of Membership

The Secretary introduced the question of amending the Constitution of the Association so as to admit a new classification in the membership and the annual fees. It was explained that in order to accommodate those members who desired to give more than one dollar yearly to the Association's work, a "Contributing Membership" at five dollars annually would probably add to the funds without disturbing in the

least the relations of the large majority who would prefer to continue the established Annual Membership at one dollar a year. By a motion of Mr. Clyde Leavitt, seconded by Mr. Ellwood Wilson, and carried by a two-thirds vote of the members present, the Constitution was altered to read: "Its membership shall include all who pay an Annual Fee of $1.00 or a Contributing Membership fee of $5 or a Life Membership fee of $25." The Life Membership fee is thereby increased from $10 to $25.

RESOLUTIONS

Amendments in Quebec: "Resolved: that as this Association hears that Quebec lumbermen have drawn up some suggestions for necessary amendments to the forest fire laws and that these have received the hearty endorsement of Hon. Jules Allard and his assistants with the assurance that this would be introduced as a Government measure, this Association heartily endorses these amendments and congratulates the Honourable Minister and urges the Quebec Legislature to pass them." Moved by Mr. Ellwood Wilson, seconded by Mr. J. B. White, and carried.

Civil Service Reform.

Moved by Mr. Clyde Leavitt, seconded by Mr. Ellwood Wilson, and carried, "That the President be authorized to appoint a Standing Committee of three to take up with the Dominion Government the matter of extending the scope of the Civil Service Act to cover the outside service of the Dominion Forestry Branch."

Forest Fire Statistics.

Moved by Mr. Clyde Leavitt, seconded by Mr. J. B. White, and carried, "That the President be authorized to appoint a committee of ten to take up with the Provincial Governments of Eastern Canada the matter of the collection and publication of uniform statistics of forest fire losses."

A meeting of the Directors was held at the close of the general meeting.

The afternoon session which was well attended was occupied with the delivery of addresses by Hon. W. R. Brown, President of the New Hampshire Forestry Association, and General Manager of the Brown Corporation of La Tuque, P.Q., on "Closer Utilization of Forest Products," which was illustrated with many lantern slides; Mr. S. Lawrence de Carteret on "The Work of The St. Maurice Protective Association"; R. H. Campbell on "Forestry and the Future"; E. J. Zavitz on "Forestry in Ontario," and W. T. Van Dusen, of the British Columbia Forest Service, on "Forestry and the Lumber Industry." Interest was added to the reading of the papers by a lively amount of discussion in which members and friends of the Association from many parts of Canada took part.

Several of the papers are given in this issue and others will be published in the March number.

The Banquet.

The annual banquet of the Association was held this year in conjunction with the Canadian Lumbermen's Association, the Commission of Conservation, and the Canadian Society of Forest Engineers. Nearly 150 took their places in the handsome dining room of the Chateau Laurier, the occasion being graced by the presence of a number of ladies. Of the quality of the speeches following the repast, too much cannot be said. Without exception, they struck and sustained a high level of eloquence, the guests giving the most implicit attention to the keenly human reminiscent incidents recounted by Sir George

Foster, the concise and interesting references to the conservation work of the Forest Products Laboratories by Hon. Dr. Roche; the eloquent charm of Sir Wilfrid Laurier, who asserted that were he given his way every forest in Canada would be state-owned and administered and that any man who cut down a tree should be obliged to plant one. Dr. Michael Clark, M.P., for Red Deer, Alberta, delivered a stirring and vital appeal for recognition of the great issues involved in the European war. Dr. Adams, Dean of the Faculty of Applied Science of McGill University, spoke on the activities of the Commission of Conservation. Mr. Gordon C. Edwards was chairman of the banquet in the absence of Senator Geo. Gordon, and was assisted by Mr. F. E. Whitman, President of the Canadian Forestry Association.

Taking New Tolls From the Wood Crop

Economy in Modern Forest Operations as Practised From the Logging Camp to the Factory.

By
Hon. W. R. Brown,
General Manager, The Brown Corporation, La Tuque, P.Q.; President, New Hampshire Forestry Commission.

(A paper read before the Annual Meeting of the Canadian Forestry Association at Ottawa, January 20th, of which the following are excrepts):

I am going to speak to you on close utilization, the steps taken to secure it, and some of the unusual products it creates. Close utilization is the first point of contact between scientific forestry and commercial lumbering, and a durable bond of mutual interest, highly essential to forestry and profitable to business. Whether a forest is considered a mine to be mined, or a crop to be raised; whether it is considered a matter of private or public concern; whether it is considered profitable or unprofitable, is a matter largely of judgment based on the conditions presented, but there is no question of the desirability of preventing waste on the one hand, and securing the largest returns from every portion of the product on the other; so that my paper will treat of the practical problems in saving from actual experience, leaving the debate as to the policies of the profession and its technicalities to more expert hands.

A Market for Hard Woods.

First of all we will commence with the uncut timberland, pre-supposing that there has been a plan made, such as a diameter cut; a selected area cut; a strip cut, or a clean cut, for the removal of such species of trees as are required for a specific purpose. Our first problem of close utilization is what can be done with the uncommercial portions of the tree which are commonly left in the forest, and what, if any, use can be

made of the other less valuable species, in order that by marketing them the cost of logging the whole may be reduced. In our region where we log the drivable soft woods, the problem resolves itself into what market can be found for the hard woods capable of being turned into lumber, bobbins and novelties of all kind. Can we find a manufacturer who will use our rock maple for shoe lasts? Or one who will use our white birch for tooth picks, spool wood, or peg wood? Can we find a jobber to cut white ash for axe-handles or shovel-handles; a tannery using hemlock bark; soda or excelsior mills using poplar wood? Can we sell cord wood to the neighboring villages at a profit? Will it pay to put in alcohol plants or charcoal burners to utilize the limbs and inferior portions of the trees? All of these questions present problems of cost, transportation and marketing too complex to go into here, but a practical knowledge of their possibilities and ability to extract a small profit will make possible the logging of a tract formerly considered merchantably inaccessible.

Waste in Logging.

The next problem presented is the reduction of waste in logging. This necessitates frequent inspections and an inspection report which is sent in each week to the main office by an experienced employee whose sole duty is to travel about among a certain limited number of operations and make sure that the specifications and conditions called for in each jobber's individual contract, are lived up to.

Then comes the reduction of waste on the drive. Dynamite is now used on rocks and obstructions in a river before driving commences, instead of on the logs during the progress of the drive. This avoids a large breakage. A stream properly improved will have one or many storage dams and all of the larger

Mr. Charles Lathrop Pack, of Lakewood, N.J., and Cleveland, Ohio, who was elected President of the American Forestry Association at Boston, January 17th.

rocks will either be blasted out or abutments built over them, and shear booms constructed in order that there may be a continuous and unobstructed passage for the logs to the mill. The use of telephone men and telephone boxes at critical points has been the common practice for some time. A clean rear is insisted on, as logs left back over a year abrase themselves and waste against rocks in the river or against the shore of a lake as they are beaten about by wind and wave. In some instances logs are left in the still waters of a mill pond from one season to another in order that the bark may be softened and drop off, thus saving the cost and waste of rossing, it being estimated that the saving in wood wasted by the barking knives is greater than the interest on the investment. In such plants however as have the modern rossing drums, this is unnecessary, as the bark is completely removed

without any appreciable loss in wood.

The Log in the Mill.

Coming to the mill, the logs are divided into size and quality, those most suitable for saw logs going into lumber and the smaller unsound or crooked logs going into pulp blocks and then ground into wood pulp by means of grinders or cut into chips to be cooked by chemical means into pulp. The sawing of the logs into either lumber or pulpwood is done with 3/16" band saw instead of the quarter inch circular saw formerly used, which saves in the width of the saw scarf, enough wood to represent many cords per day. A band saw also leaves a smooth cut end instead of a rough abrased end, which is an advantage and saving when the pulp blocks are cut into chips. In the saw mill all spruce, fir and hemlock waste in sawing, such as slabs, edgings, and butt ends, are run through a hogging machine which converts them into chips. The remaining waste from pine and cedar together with the saw dust and bark is carried by conveyors into the boilers as fuel.

Cooking Oil Produced.

In the changing of logs into lumber and paper many by-products of unusual forms appear. The spruce, fir and hemlock lumber either goes into house frames, clapboards, piano stock, cross-arms for telegraph and telephone poles chemically treated to prevent their rotting, piling and timber for wharfage soaked in corrosive sublimate as a

Brush carefully piled on Timber Sale at Clinton, B.C., in the Dry Belt, in readiness for burning.

preservative, and into many other forms. The cedar is commonly manufactured into shingles and fence posts; the pine at our plant goes to a sash and door mill exclusively; the ground wood goes into newspaper; chips are converted by the sulphite cooking process into pulp, chiefly distinguished by its long and strong fibre, and this sulphite pulp in turn is sold as a raw product to form an integral part in newspaper making, at the ratio of about one part of sulphite to two parts of ground wood. Sulphite also goes to form the principal ingredient of writing, wrapping or book papers. All of the sulphite pulp which we manufacture is bleached, and this calls for a large electrical bleaching plant to manufacture the necessary chlorine liquor. As a by-product from this bleaching plant caustic soda is manufactured in considerable quantities and sold principally to soap manufacturers. From the chemicals set free in the caustic process, chloroform and muriatic acid are obtained. We are also able to hydrogenate vegetable oils and manufacture a cooking fat which we are now placing on the market, called Kream Krisp and Vream, which is purer in composition, superior to, and more economical than pure lard. From the pulpwood chips also, through a soda ash process, called the sulphate process, sulphate pulp is produced, which is characterized by its long and strong fibre, and this in turn is manufactured into a strong wrapping paper which is known as Kraft paper, dark brown in color, and most commonly wrapped around magazines, papers or bundles. Many new and useful articles are being manufactured out of this paper which may interest you on account of their unusual character, as they represent reduction in the cost of living and the close utilization of forest product.

New Uses of Kraft.

Large quantities of Kraft paper are used in department stores, particularly in large mail order houses in the West who ship by Parcel Post. It is especially suited for envelopes such as are manufactured for heavy documents and money, in place of leather containers. Strips of Kraft paper are used in binding corners of cardboard boxes, particularly shoe boxes. Strips of gummed Kraft paper are used in the same manner as twine about boxes and packages and are much stronger and do not slip off. Even coal is now being delivered in bags made of Kraft paper in place of canvas bags, which had to be emptied and returned, the paper bags being merely burned up with the coal. With a light backing of cloth fibre and a filler to protect against dampness, Kraft paper, called "watershed," is used for covering automobile tires in the place of burlap. "Watershed" paper is also used

Slash well piled for burning along new government road, Fort George, B.C.—A good example to settlers.

for the oversea shipment of dry goods and groceries. Kraft cardboard is used in making dress suit cases. Embossed Kraft paper is used for wall papers, book covers and the covering for fancy boxes.

Imitation Leather.

Very good imitation leather is made from Kraft paper. Stripped into narrow rolls 1/8" wide it is run through a machine which gums one side. The gummed side is then spread with a fine lint of cotton or linen. These strips are run in a spinning machine and twisted into threads, the cotton and linen fibres protruding as a thin fuzz. These threads are afterwards woven into various fabrics, such as imitation burlap used in wall paper, heavy cloth for upholstering furniture, grain bags, tailors' linings for suits of clothes, cotton and linen towels, webbing, straps for surcingles, etc. By the introduction of colored threads, pleasing designs are worked into the fabrics. It is sometimes stamped in colors in the same manner as cotton cloths. Small twine made of twisted Kraft paper is used in tying up bundles; for weaving into coarse matting; and as a warp for rugs and carpets. Twisted into many strands it is woven into all sizes of rope, particularly laundry and window rope and binder twine for harvesting machines. To add strength it is sometimes spun on a hemp core.

Even Water Pipes.

By a new patented process our company is now producing paper pipe wound over cores of various diameters and made in various thicknesses, which is thoroughly permeated with a tar compound, fodming a strong compact paper pipe, capable of taking a thread and lighter and less expensive and more durable than iron pipe. This is used for various purposes, such as underground conduits for electric wires and for resisting the action of various corrosive acids, especially in coal mines.

And Baby Carriages.

Kraft paper could be easily adapted to the same use discovered by a Japanese during the Russian war who invented a soft, tough and waterproof paper. They also made it into paper sheets which could be folded into a small package and which would keep out dampness. There are other uses for this paper, such as for napkins, handkerchiefs, paper plates, cups, pails and other articles too numerous to mention, but the most surprising use it has been put to is that one-eighth inch strips shellaced and twisted are used in manufacturing articles of furniture in the place of, or in conjunction with, rattan, such as chairs, tables and baby carriages. So that it would appear that there was a profit in changing wood into pulp, making the pulp into paper, and turning the paper back again into wood.

Chloroform and Cloth.

From these illustrations you may see that the process of the utilization of the by-products during the progress of the tree from the forest to the consumer is carried on at every step in its manufacture, producing such widely different articles as chloroform and cloth, iron pipe and lard, and yet the possibilities inherent in the ingredients of wood have hardly been scratched, when it is born in mind that in each chemical process nearly one-half of the actual weight of the wood is thrown away as irreclaimably valueless.

Mr. Punch's Charivaria in the last number to hand says: "A Berlin professor, lecturing on the use of trees as fodder, stated that experiments have already been made in feeding dogs with beech-wood. It is hoped that in time these intelligent animals will be trained to subsist upon their own bark."

Forestry and the Future

Canada Must Wake Up to the Opportunities From Sane Forest Management—Preparedness and Production.

By R. H. Campbell, Director of Forestry.

Two words or ideas have come prominently to the front in discussions of national affairs since the war burst upon us. These words are "preparedness" and "production." In the years before the war and in the first few months of the war we were inclined to think but little of the preparedness, the efficiency, the "Kultur" of Germany, but as the fierce struggle continues in intensity and the strength of the enemy shows no outward sign of waning there has been borne in upon the mind a misgiving whether the British policy of muddling through may not be too wasteful and dangerous, and the conviction is forced on us that the triumph of democracy we feel this country is fighting for will have to have infused into it some of the national organization and the efficiency of our chief enemy. And though we hope and pray that this war may be the last of its kind—so terrible, so widespread—and that we may have to look to a future of warfare and strife among the nations, still, whether in war or peace, the demand for national organization and efficiency will remain if the varying and manifold needs of the future are to be met.

The preparedness of Germany was a preparedness not only on the strictly military side but in industries, in trade, in agriculture and in the management of all her natural resources, including the forests. All of these were developed to a high state of efficiency, they were pushed to larger production by careful management and use, and the methods of development and utilization were the subject of thorough and scientific investigation.

Forests in Europe.

But what I wish to draw attention to is that the creation and management of forests was an integral part of the programme and that the modern increase in Germany and other European countries in population and industry has meant not the destruction of the forest but an increase of the area under forest and a larger production and better utilization. The attitude of the railway station agent at Niagara, who, when a European coming across from the United States for a few days, asked him for information as to the location of the forests, replied, "This is a civilized country, we have no forests," is perhaps characteristically Canadian and is indicative of our thoughtlessness and immaturity.

The following table shows for the leading European countries the population per square miles and the percentage of the land in forest:

	Population per square mile.	Percentage of land in forest.
Belgium	652	18.3
Germany	310.4	25.9
Austria	247	32.5
Switzerland . . .	234.8	22.7
France	189.5	18.7
Russia (in Europe)	64.6	31.0
Sweden	32.4	47.8

Taking Belgium as an example it will be seen that, although the population is 650 to the square mile or

over one person to the acre, as compared with two to the square mile in Canada, though on an area of 11,373 square miles, as compared with 3,729,665 square miles of Canada, a population of 7,423,784 is supported, as compared with a population of 7,206,643 in Canada, 18% of the area of the country is kept in forest.

The conclusion seems clear then that a state densely populated and highly organized agriculturally and industrially, does not show its civilization by destroying the forests but by preserving them and working them into the national economy.

Canadian Forest Products.

The value of the forests to Canadian industry and development is already large. The report of the last census shows that there were 4,999 establishments engaged in making timber or lumber or in its manufacture, that the capital invested in them was $260,000,000; that there were 110,000 employees receiving $39,379,000 in wages, and that the value of the product was $185,000,000, and this does not include manufactures such as paper, vehicles, boats, agricultural implements and others in which large quantities of wood are used. The export of forest products and manufactures of wood (not including those only partially made of wood) was $53,344,616. The revenue received by the different governments of Canada directly from the forests during the year 1913 was $7,433,770.

There is therefore strong reason from the history of older countries and the past and present contribution of the forests to Canadian prosperity, to decide that a policy of preparedness and production should be applied to Canadian forests and to ask how it should be applied.

"Preparedness" for Canada.

Preparedness implies a knowledge as thorough as possible of what has to be dealt with. For the forest this involves a system of timber surveys, general at first but steadily increasing in intensity, until the whole field is thoroughly covered. Such surveys will give information as to the total stands of timber, their distribution and their condition, and will show whether they are in general located on agricultural or non-agricultural lands. The information at present available in regard to the timber resources of the Dominion is indefinite and is based on theoretical estimates from very general information. All the governments in Canada are gathering such information, some regularly and on a definite plan, some spasmodically and without any plan, but the work should be pushed forward on some definite scheme in which the Dominion might very well consider assisting in a large measure.

Setting Apart Forest Land.

Preparedness involves the handling of the forests the general body of which is on non-agricultural lands in a different way from those forests which are on agricultural lands. Wheat and timber cannot be grown on the same land at the same time, nor can they be grown on the same land in alternate years. One or other must yield place, and it seems clearly the duty of the state to decide upon and definitely set apart the lands that are to grow timber, whether they be called forest reserves or simply forests, or whatever name they may be called by, and no agricultural entries for such lands or clearing of such lands for agriculture should be permitted until an official and expert examination decides that the lands can be so more profitably used, and even then they should be opened only under such restrictions as will adequately protect the surrounding timber. The determination of the best economic use of land is of great importance and is something which should not necessarily be settled by lumbermen and foresters alone but in which the co-

operation of the agricultural and soil experts of the departments and colleges of agriculture should be secured.

New Uses for Wood.

Preparedness involves the development of uses for wood so that they may contribute to the growth of industries using wood, and may assist other industries using its products indirectly. When we have grown a forest we really do not know what we have. We have a product varying in qualities generally known as wood. We have small and uncertain knowledge of its qualities, structure and composition. We have used wood in the condition of wood, or we have separated some of its component substances, but we have not as yet real or thorough knowledge of what we are dealing with. Research must be carried on so that we may market our products with a statement of their qualities guaranteed by the results of scientific investigation; so that the best processes may be followed in our industries, such for instance as that of pulp and paper in which Canada may fairly aspire to first place in the world. The attention given at the present time in America to the use of pine oil, a product of wood distillation, in ore flotation is an indication of the uses which may develop from a more thorough knowledge of our woods and their prducts. Not the natural richness of the country but scientific research and thorough development of its resources gave Germany the place in industry and commerce which she held before the war and might have continued to hold if she had been content with peaceful development. It was in order to begin the organization of such research work in regard to wood that the Forest Products Laboratories of Canada were established by the Department of the Interior in co-operation with McGill University. It is hoped that the beginning thus made will grow into an important auxiliary to the development of the country.

Wood Production.

Production means the growing of more and larger crops of wood. The experience of older countries and the information obtained from a careful examination of our own should give the necessary indication of how this should be brought about. The timber surveys show that the mature forest bears but a small relation to the forest area in general but that the reproduction in young growth is general and on the whole satisfactory. There is mature timber and to spare for the moment, but the main hope of the future is in the protection of the immature stands that will be merchantable at no distant period. This is a crop already sown and half matured without cost to the country and will be the cheapest crop of timber that will ever be grown here. Protection for this crop must be given if our production is not to fall. There is no throughly adequate system of protection yet in force anywhere in Canada, and neither government nor timber owners can afford to stop at the stage which has been reached. Better organization, better equipment, greater efficiency in men, more thorough education of the public must be had if the future is to be secure.

The Duty of Planting.

Production means the planting of forests. In old settled districts in Ontario, Quebec, and other provinces, and here and there throughout the western prairies are sandy or rocky tracts of land that have been bared of forest, are not now used for agriculture, and which must be replanted with trees if they are to be made productive. Belgium, France, Germany, Scotland, replant such lands at a cost of $10 to $20 per acre, and it has paid to do so. Both Quebec and Ontario have begun planting and a beginning has been made in the prairie provinces by the

Dominion Government and though costly it is essential if any crop of wood is to be produced at all on some lands and if we are to do our utmost in wood productin. It is to be hoped that we will not so treat our remaining areas of forest that this expensive method will have to be resorted to generally.

Production must be improved by being placed on a permanent basis. The speculative phase that we have passed through and are passing through in Canada was based too much on disregard of the future or on blind optimism. Optimism is good but should be founded on knowledge not on ignorance. When a mill for manufacturing lumber, pulp, paper or whatever it may be is established, when a community grows up dependent on it, it should have behind it the necessary supply of raw material to make it permanent, not only that business may prosper but that homes may be secure. Trade depression can probably not be avoided but every effort, public and private, should be made to see that industries that are established should as far as possible have reasonable expectation of permanency and that every means should be taken to secure the preservation of the supply of raw material necessary for such permanency.

(From a paper delivered before the Canadian Forestry Association Annual Meeting, 1916.)

Forester for N.B. Firm

The latest lumber company to engage the services of a professional forester is J. B. Snowball & Co., Ltd., Chatham, N.B. This company has employed Mr. J. R. Gareau, a graduate of the Quebec Forest School, Laval University, to have general supervision over the woods operations on the company's limits. He will also make a map and timber estimate of these limits, as well as enforce close utilization of all merchantable material. Cutting operations will be regulated with a view to ensuring the perpetuation of the forest, and particular attention will be paid to fire protection. Other companies in eastern Canada employing professional foresters are the Laurentide Company, the Riordan Pulp and Paper Company, the New Brunswick Railway Company, and the Canadian Pacific Railway.

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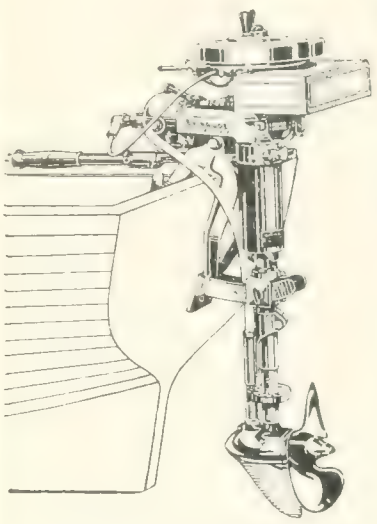
EVINRUDE



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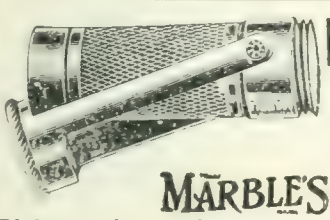

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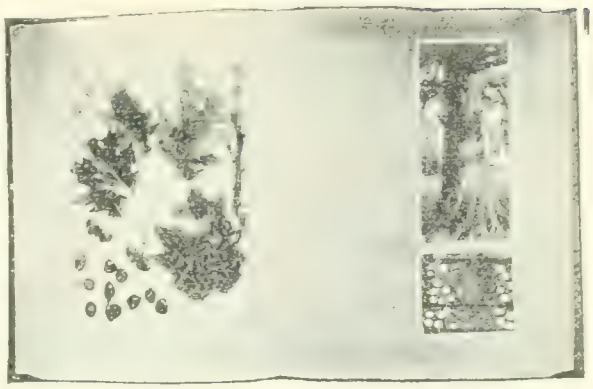

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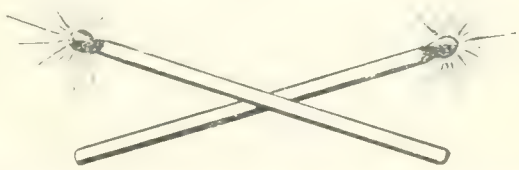

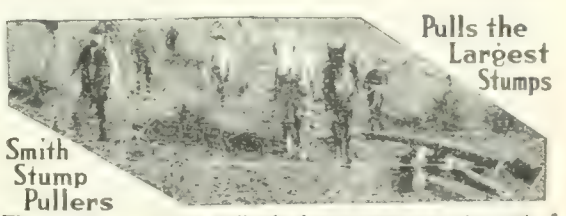

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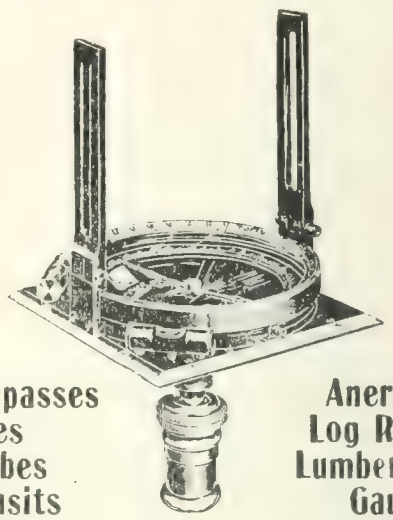

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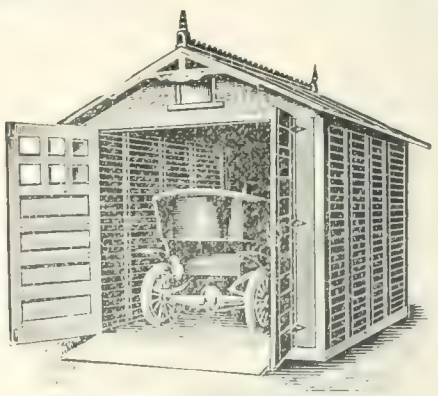

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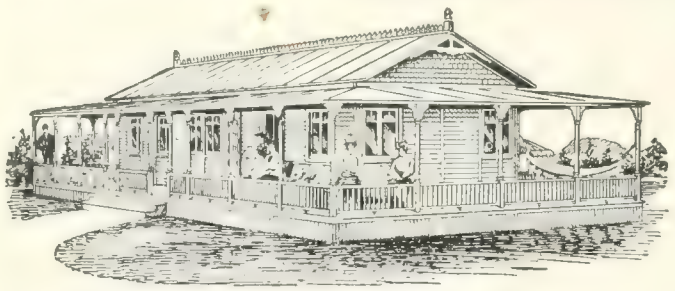

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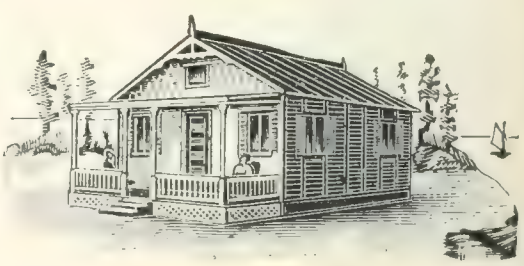

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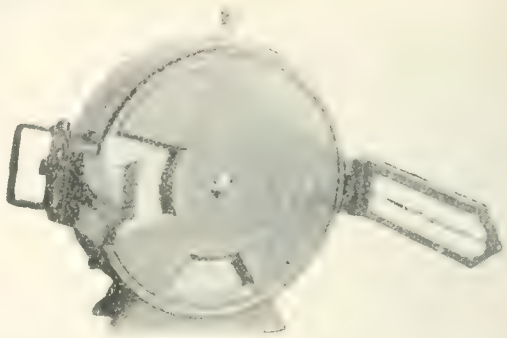

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Canadian Forestry Journal

VOL. XII. MARCH, 1916. NO. 3.

(Printed at Kingston, Ont.)

On the Norfolk Sand Dunes.

The drifts here are particularly bad, but will be stopped by the planting of evergreens.

Forestry Work in Ontario

Education Required to Link up Interest of Southern Ontario with Forest Problems of the North.

By E. J. Zavitz,
Provincial Forester of Ontario.

In considering the forestry problem in Ontario, we must bear in mind the geographical arrangement of the province. We have Ontario divided into three great regions—the southern agricultural and industrial region; the Central Forest region; and the so-called Clay Belt at the north.

Ontario differs from some other provinces in the fact that a large proportion of the population is not directly concerned in forest industries. The ordinary citizen in sou-

thern Ontario is not likely to take an active interest in forest policy, and it will take considerable education and publicity work to make him see that he is a joint owner in the state forest lands.

The Clay Belt at the north, estimated as an area of sixteen to twenty million of acres, is a region of spruce, balsam, poplar and birch of comparatively small timber, probably more adapted to the pulp than to the lumber industry. This region has in general a soil adapted for agricultural development and it is being opened for settlement.

Opinion Favors Burning.

I do not propose to discuss at any length the forestry problems which are developing in this region. Owing to the local opinion that burning, clearing and cultivation will improve the climatic conditions of this region there is a tendency to look upon forest fires as a blessing.

It is certain that clearance, drainage and cultivation of the land will lengthen the growing season. There are many soils with a large amount of vegetable mould and humus where limited burning may be beneficial but indiscriminate burning is injuring many of the heavier clay soils, especially upon rolling land.

Forest Reserve of All.

Lying to the south of the Clay Belt is a region about one thousand miles long and from one hundred to two hundred miles in width, which from its very nature can never be developed along agricultural lines. Here and there are patches of soil suited for agriculture but in the main this must always be a forest and mining region. Within this region we have a number of Reserves and Parks. I often feel that it would have been preferable to have created this whole region a Forest Reserve and then to have admitted the smaller interests under special conditions. Within this region there is the outstanding problem of protection. Until this is reasonably well accomplished it is useless to talk of artificial reforestation.

The old settled agricultural portion of Ontario presents forestry problems peculiar to its own conditions. We have a region as large as some provinces, a region which has been cleared and more or less settled. We have large areas upon which efforts to farm have been attempted and given up as a hopeless task. Thousands of acres of worthless areas have developed which present social and economic conditions demanding attention.

Experimental Planting.

Ontario has undertaken a demonstration of the possibilities on one of these areas in Norfolk County. Here we have a Provincial Forest Station with two thousand acres, in the heart of a good agricultural region, where a demonstration is being made at forest planting and other forestry problems.

We have reclaimed by forest planting, sandy soils which had become a menace to surrounding territory, sand dunes covering township roads, etc. Aside from the actual work being done at this Station it is interesting to note the influence upon the surrounding district. The planting of small pines on these sands was at first ridiculed by many of the farmers of the district. Our first planting in 1909, upon a sand dune which was moving across the township road and over which many farmers had to pass, is to-day a young forest of imposing character. I repeat that at first this work met doubt and even ridicule. To-day it has the active support of the local people and last season over fifty thousand trees were given out in the vicinity to private parties wishing to follow the example upon similar soils.

I wish to point out that we do not expect to solve the problem of a future wood supply. We are, however, reclaiming waste land and lay-

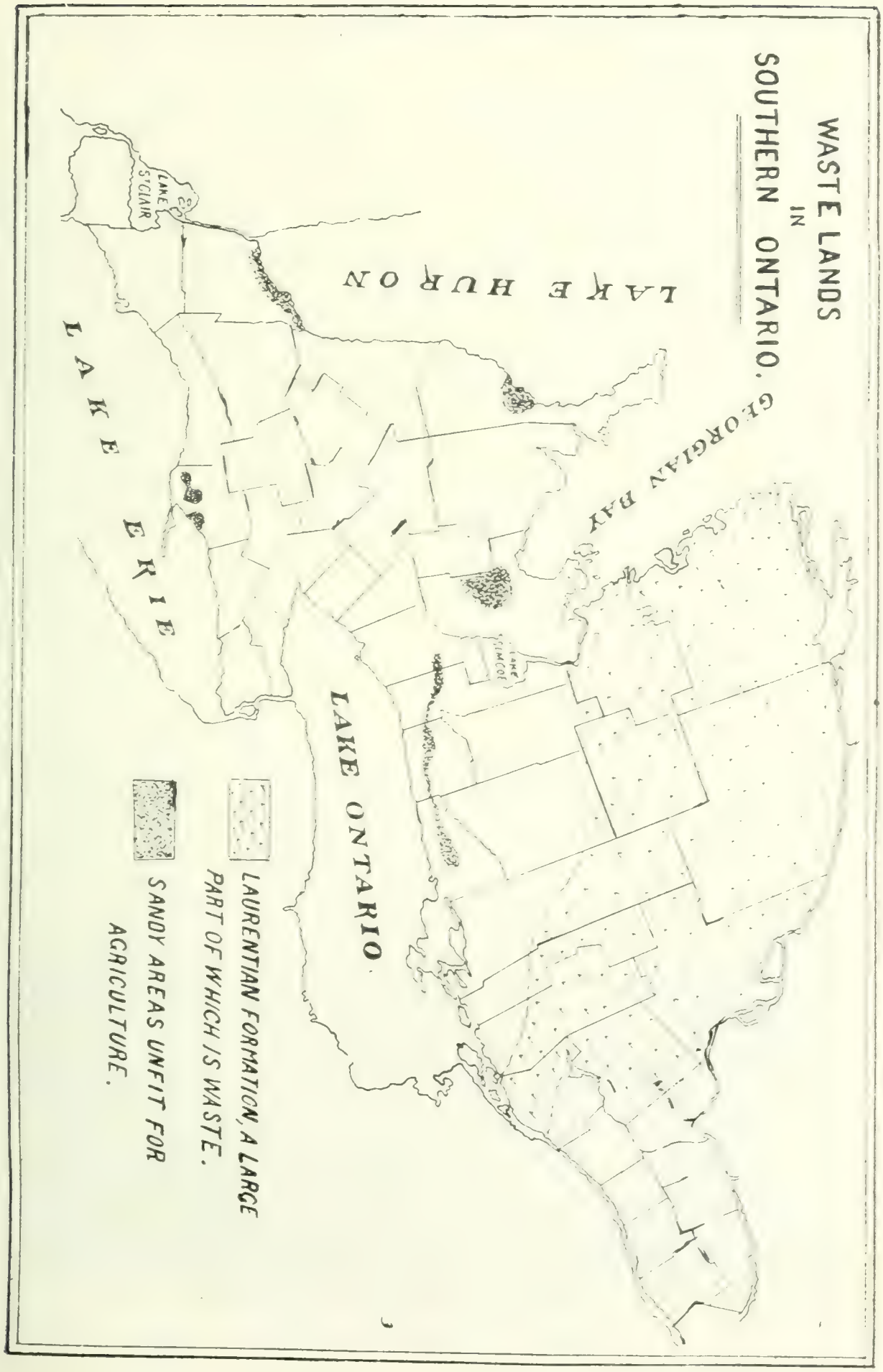


FIG. 1. Waste Lands in Southern Ontario.

ing foundations for future forest planting problems which must surely confront us.

The success of this experimental Forest Station in Norfolk will open the way for extension of this line of work in other parts of Ontario.

Wide Distribution.

Along with this work in Norfolk, we produce forest plants for distribution to other parts of Ontario to private owners wishing to undertake such work. This last season we sent out over three hundred thousand plants and in many parts of Ontario we have private demonstrations of the practicability of forest planting.

The Forestry Branch at Toronto has charge of railway fire protection under the Board of Railway Commissioners. This work is being organized along lines which will not only give improved protection but will also place the blame for forest fires where they belong. I anticipate that as much as the railways have been to blame in the past the day has arrived when adjacent property owners will have to bear their proportion of responsibility. I refer to the settler and lumbermen who must meet the railway half way in solving this problem. Our aim should be to require as much of adjacent owners in disposing of fire hazards as we now demand of the railway on its right-of-way.—(From Mr. Zavitz's address to Annual Meeting, Canadian Forestry Association.)

Placing a Barrens Under Crop.

Shifting sand at Norfolk Forest Station planted with Scotch pine and Jack pine, showing third season of growth.

How Dominion Parks Management Combats Forest Fire

A Complete System of Fire Warning Applied to Tourists, Sportsmen, Etc.—the Principle of Affirmation.

By J. B. Harkin,
Commissioner of Dominion Parks.

The Forestry Committee of the Conservation Commission last year called attention to the desirability of removing inflammable material in the woods on government lands outside of the railway right of way. We have made a beginning at this work. For a portion of the past summer we had a camp of interned prisoners doing road work in Rocky Mountain Park. The road paralleled the C.P.R., and while road construction went on we also cleared the dead and fallen timber outside the right of way as suggested by the Committee. I may add that the proposition so appealed to us that we also applied it to the road the aliens were building, clearing out the dead and fallen material for 50 feet on each side of the road and at the same time trimming the green trees to a height of 5 to 6 feet above the ground.

We have devoted a good deal of attention to a fire prevention campaign. For practical purposes there are only two kinds of fires—man-caused and those resulting from lightning. The latter we cannot prevent but in regard to the former there does not appear to be any good reason why a great deal cannot be accomplished. I do not admit that one fire in 10,000 is started maliciously. Practically all are caused through ignorance and carelessness. It is the old story, "I didn't know it was loaded." The obvious course to follow then is to endeavor to educate every man who may by any chance go through the woods to guard against doing anything which may start a fire.

People have been educated to recognize the necessity of pure air; people have been educated to suffer the isolation of their loved ones in cases of contagious disease. Surely there is no reason why they should not also be educated to be careful in regard to forest fires.

The Force of Affirmation.

I think those who have studied the psychology of it, agree that men are influenced most by affirmation and reiteration. If a statement is affirmed vigorously enough and reiterated often enough practically all men finally accept it. There is no better vindication of this fact than the methods and the success of patent medicine men. You all know how they affirm and reiterate. Just think of the influence their campaign has on every one of us. There is scarcely a man present, I will venture to affirm, who talking ordinarily with contempt for patent medicines, has not on occasions when he found himself pale or out of sorts, gone to a drug-store and purchased some remedy that he has

seen blazoned in the newspapers and on the bill boards as being good for pale people. It is simply a case of the efficacy of affirmation and reiteration.

I spent some time ten years ago on a prairie ranch in a dry season and I may say that the affirmation and the reiteration on the ranch regarding care with fire rapidly developed in me a habit of carefully extinguishing matches and cigars which persists to-day as strongly as it was then. I automatically extinguish matches, cigars. The habit is such that I really do the act without any conscious thought.

Match Box Warnings.

As practically all fires originate in the final analysis from matches we decided it would be good policy to reach the people who use matches by having a fire warning notice put on the match boxes. All the match companies in Canada: The Eddy Company, Hull; the Canadian Match Co., of Drummondville, Que.; the Dominion Match Co., of Deseronto, Ont.; the Eureka Match Company of Halifax, very promptly acted on our suggestion and the result is that every person who uses matches is bombarded by the affirmation and reiteration of the fact that he should save the forest by being careful to extinguish burning matches. There is also a notation that the notice is printed at the request of the Dominion Government. This, I believe, gives additional weight to the warning and at the same time constitutes a recognition on the part of the Government that the Company is co-operating with the Government in an important campaign. I should add that the match companies made the necessary label changes entirely at their own expense.

Warning Sportsmen.

We recognized that large numbers of people annually go hunting in the woods and that it was desirable to specially educate them in regard to fire. So we asked the Dominion Cartridge Co., and the Remington Arms-Union Metallic Co.—the two large ammunition companies of Canada to insert a fire notice in their shell boxes. As in the case of the matches the reply was favorable and the result is that to-day every box of shells issued by these companies contains an effective fire notice. No hunter can get away from the warning. Every time he opens a box of shells he finds a warning to be careful in regard to fire. The warning is thus given at the psychological moment. Moreover, the warning is worded to show him that as a hunter he has a real personal interest in helping protect the forest.

Notices in Tents.

Not only hunters but also many others go into the woods and camp in tents so we decided tents would be a good medium of education. The result is that nearly all the tents manufactured in Canada to-day have a fire-warning notice sewn into them. Every time a man awakens in the morning this warning is staring him in the face. Every time he enters the tent the notice reiterates the fact that he must be careful in regard to fire.

Notices on Axes.

The next person we thought might cause forest fires was the man who works in the woods with an axe. We offered to supply a firm label to the Walters Axe Company of Hull and the Company very promptly agreed to stick them on their axes. The label contains a picture of a forest fire and the following legend:

"No work for the Axeman

If the forests are destroyed by fire,—save them by extinguishing completely camp-fires, cigar, cigarette butts and live ashes of pipes."

Telephone Books.

The co-operation of the Bell Telephone Company was also enlisted in the educational campaign. It was felt that many of the people who have to consult a telephone directory at some time or other go into the woods and that conspicuous fire warning notice in the directories of the Bell Company would help impress upon them the lesson of carefulness with fire. The Bell Company very generously placed at our disposal gratis, half a page of their directories.

The work already outlined although started to benefit parks primarily related to fire education in general but the educational campaign was also carried on in other ways with special reference to the parks.

The tourist and the railway are the two sources of danger in the parks. The machinery developed by Mr. Clyde Leavitt, of the Conservation Commission for dealing with railway-caused fires is so effective that the railway fire now is no longer the thread-suspended sword that it used to be. Moreover, while developing our educational campaign it occurred to us we might help a little by making an appeal to the railway-men who cause the fires—the man on the engines—consequently we arranged with the C.P.R. and the G.T.P. for the posting of a card in the cab of every engine operating through the parks.

Notices to Passengers.

To reach the tourist we naturally sought the co-operation of the railway companies. The first step taken was to ask the companies to post fire notices in their coaches and to print notices on the time cards and on their dining-car menu cards. All the railways responded promptly. No doubt these various notices are now familiar to all of you. To further emphasize the warning, arrangements were made with the C.P.R. hotel department that a suitable fire warning notice should be printed in the menu cards of all the Company's hotels in the parks. In addition we printed an attractive card notice and had one hung in every guest room in every hotel in the parks.

Practically all visitors to the parks do a good deal of driving or horseback riding. Consequently we had two types of attractive metal fire notices prepared; one was attached to the reins of all livery saddle ponies in such a position that the rider could not grasp the reins without noticing it, the other was attached to the dashboard and the backs of seats of all livery rigs in order that every one driving would have the notice constantly before him.

Of course in addition to these various schemes we also followed the usual practice of having poster notices distributed on all roads and trails in the parks so that no one could even walk around without learning the gospel of fire protection. For this purpose we used a special enamelled metal sheet in several colors and bearing a picture of a forest fire calculated to arrest attention.

Encircling the Tourist.

Thus you will see that with regard to the tourist we carried out a pretty complete campaign on the lines of assertion and reiteration. We talked fire protection to him in the railway time cards, in the railway coaches, in the dining cars; at every meal at the hotel and restaurant dining-rooms; in the moving picture shows; we kept him in mind of it when he was riding and driving or out walking on the trails. We kept it before him when he was writing letters home and we even followed him to his bed-room with an appeal.

From the Association's Cartoon Service supplied to score of newspapers.

Father Bull: "We'll have to stop every financial leak if we want to win this war."

Jack Canuck: "Leave it to me. I'll put another million acres under wheat."

Father Bull: "That is mere patchwork, my boy. Why not stop your forests from burning down? These acres of splendid timber at your door represent the easiest money you can ever lay your hands on."

Newspaper Note:—"The Canadian Forestry Association makes the statement that if Canada would take the simple measures to stop the plague of forest fires, the timber saved would pay the annual interest on the last Dominion loan of $100,000,000."

Silvicultural Problems of Forest Reserves

The Main Business to Provide for the Future—Dominion Government the Logical Controlling Power.

By

Dr. B. E. Fernow,

Dean, Faculty of Forestry, University of Toronto.

Last summer, through the courtesy of the Director of the Dominion Forestry Branch, and in his company, I had the privilege of inspecting conditions in some of the Dominion Forest Reserves in the prairie provinces and of some parts of the Rocky Mountain Reserves.

This inspection was made with a view of enabling me, as chairman of the newly established Advisory Board of the Forestry Branch, to formulate propositions for investigatory work as a basis for an eventual technical management of the Reserves.

While ten weeks travel can, to be sure, give only a very superficial insight into conditions and problems, contact with actualities and intercourse with the men in charge permits at least a judgment of the general requirements in the administration and management of these properties.

The practical wisdom of inaugurating the forest reserve policy would, I believe, be admitted by any one on general principles, but by him who visits the reservations and secures even only a slight acquaintance with the actual conditions surrounding them, any doubts as to the wisdom in each particular case will vanish, and the conviction will be strengthened not only that these reservations should become or remain without question permanent, but that they should be added to, and also that they should remain under the control of the Dominion, which can much better than the provinces afford to carry the burden of the dead work that must be done to make these properties serve their object, namely to furnish continuous wood supplies to the surrounding settlements. The visitor will also realize, that to fulfill their function, namely to furnish wood supplies, a systematic *technical* management is a more or less urgent necessity and should be inaugurated as early as possible upon the basis of carefully prepared working plans.

Need of Technical Men.

So far, in the minds of the public not only, but of officials as well, the problem of the forest reserves has appeared of the same nature as that of the mere administration of timberlands; so far, indeed, hardly more than a timberland administration has been attempted, albeit with a somewhat more conservative disposal of available supplies. Of the practice of forestry, the technical art, there is as yet hardly a beginning. For such an administration

as has been hitherto attempted technical men and technical knowledge are hardly required. The fact that most reserves are under the management of non-technical men bears out this contention: Forestry practice is still absent.

The application of forestry means efforts to reproduce the harvested crop, efforts to make the reserves continuous producers, to manage them with a view to sustained yield, as it is technically called, which can be done only by application of silviculture, the art of forest crop production.

The principal reason for the absence of such forestry practice is probably an economic one. Most of the reserves are located where, as yet, no market or only a limited market exists, and, moreover, the best timber, the marketable portion on most of the reserves, had been placed in timber limits, which were haggled away before the reserves were created, hence the administration was financially handicapped at the start.

In addition, the administrator of the reserve, if he consulted the technical man, would have found out that to reproduce the forest crop costs money just the same as reproducing the farm crop, and as he is accustomed to deal at any rate only with present-day affairs, he is apt to let the future take care of itself and to confine himself to present-day timber sales of whatever available supplies are at hand. He thinks that if he has made provision against fire danger and for reduction of waste generally, perhaps restricting the cut to a diameter limit, he has done all that can be expected. Surely, these administrative measures are of primary importance and need first consideration, but if this were to remain the proper attitude, the reserves would fail of their object and altogether the prosperity of the country would suffer in the future.

Long-range Calculation.

The forester also takes into consideration the economic conditions under which he is to practice his technical art; he also is shy at avoidable expenditures, but he makes a long-range calculation. His business is to provide for the future and hence he looks into and calculates with the future, and he knows from the experience of other nations that it requires expenditure and apparently dead work in the present to secure results for the future.

His finance calculation is for the long run!

We must not allow ourselves to be deterred by the fact that the forest crop is slow in maturing, that it takes many decades from the seedling to the log tree and not less than 60 to 120 years for a profitable crop to mature.

On the contrary, this is the very reason for a timely beginning to start the crop. It is this time element which makes the forestry business unattractive to private enterprise and furnishes the argument for government to engage in it, the justification for setting aside forest reserves and for handling them for the sustained yield under systematic forest management. Only a government with the duty to consider a long future, with providential functions, can afford to do this.

From the standpoint of the more or less immediate need of inaugurating such systematic forest management, we may classify the Reserves into four or five classes.

There are some reserves, located near well populated districts, whose supplies are already being heavily drawn upon, as e.g., the Cypress Hills Reserves in Alberta and Saskatchewan, the Pines and Nisbet Reserves in Saskatchewan, the Turtle Mountain Reserve in Manitoba. Here, there should be immediately inaugurated a well considered felling plan and a judicious reforestation programme. Under pre-

sent methods of mere exploitation the virgin supplies must be soon exhausted, unless adequate provision is made at once for a new crop.

Next, we have reserves which, as yet, are but lightly drawn upon, but which within the next decade promise to come into market more fully, as the settlements come up to their boundaries and the settlers' wood supplies are giving out. Such are the Duck and Riding Mountain Reserves in Manitoba. Here, every opportunity for more careful study of the silvicultural problems should be embraced, and a thorough preparation for technical management should be begun now in anticipation of their coming fully into market soon.

Where Planting is Needed.

Then there are a number of reserves that were not set aside on account of their timber, which was either used up, burned up, or naturally absent, but on account of the unsuitability of the soil for farm purposes and the possibility of using it for timber crops. Such reserves are the Sprucewoods Reserve in Manitoba, partly wooded, and the Manitou Reserve in Saskatchewan, largely without natural growth, and several other sand hill territories. Here, planting operations should be begun at once, first trial plantations with various species and methods, and, after experience has been gained, on a larger scale, with or without assistance by natural regeneration as the case may be.

Lastly, there are extensive reserves in the northern prairie regions and in the Rocky Mountains which are as yet so far removed from market as to place them last from the standpoint of the need of technical management. Here the problems are still mainly of administrative character: to prevent further deterioration of the properties, especially by fire; to regulate the use of whatever resources may be available, like, e.g., pasturage; to improve these resources; to make them accessible, and, as far as technical interest is concerned, to study the silvicultural problems against the day when they must be solved.

All reserves, however, once set aside for permanency, should be administered under systematic working plans, more or less elaborate especially with reference to their utilization; and, if they are to do justice not only to the present, but also to future needs, such plans must eventually provide for the application of proper silvicultural methods for securing a continuance of wood crops.

Importance of Planning.

There is no other productive business that needs so much planned and conservative procedure as the business of producing forest crops, for the reason that not only do these crops mature slowly, but there is little chance to advance and improve the crop after it is once started; its proper start, therefore, is the important thing. The manufacturer can change his processes in a few weeks, the farmer from year to year, but the forester once his crop is started, may not change his procedure for a century, and there is only limited chance during the life of the crop to interfere with its development; therefore, the necessity of careful planning.

If our reserves were all first-class, useful virgin timber, the working plans would be a simple affair. They would consist in prescribing the cutting of the year's requirements in such a manner as to secure reproduction — a natural regeneration. But this is by no means the condition, even in the well wooded reserves; only small portions consist of mature, useful timber, largely spruce; large portions, as a result of fires, represent young growth or are grown up to undesirable or at least less useful species, principally aspen; some of these aspen stands are rotten and useless; some areas are

mere brushlands, and still others entirely waste—dilapidated woods which only a laborious building-up process can bring into desirable productive condition, and that means careful planning and eventually the necessity of expenditure in starting future crops.

In this connection, there is one feature of importance to which I may refer in passing, that pertains at least to some of the reserves in the prairie region which is encouraging in this respect, namely the remarkable rapidity of growth, which excels that of the eastern provinces, and promises early maturing of a valuable crop.

This statement has special reference to the white spruce, which on the deep soils which it occupies grows for a long time on the average at a rate of 5 to 6 years to the inch, making a 15-inch tree, 80 feet in height, in 80 years.

(The foregoing forms part of a paper read by Dr. Fernow before the Commission of Conservation at the 1916 meetings. The balance of the paper will be published in the April issue of the Journal.)

Approves Quebec's Amendments

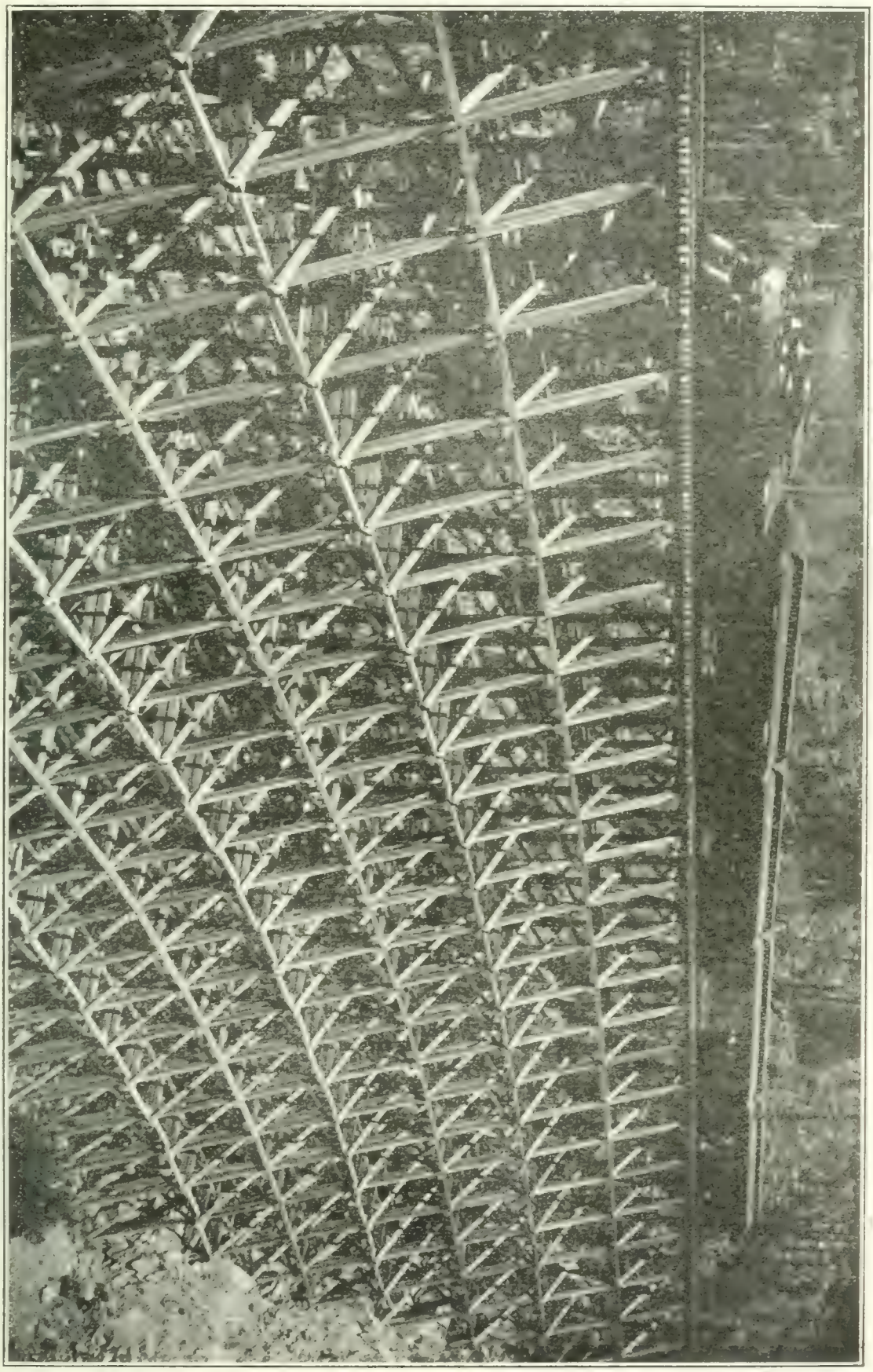
(Montreal Herald)

The paramount importance of preserving our forests should ensure the most sympathetic consideration by the Quebec Government of the proposals recently submitted by a deputation of timber limit holders to prohibit the setting out any settlers' clearing fires. Briefly, the limit holders ask that the law shall prohibit the setting out of any settlers' clearing fires between April 1 and November 15 without the written permission of a qualified ranger. The law at present makes the "permit season" only from April 15th to June 15th, and after September 1st. That is, the present law fails to specify any form of control whatever over settlers' fires between June 15th and September 1st. The limit holders ask that the entire season of fire danger be blanketed by the requirement regarding permits for fires. Settlers are to-day the biggest enemy to forest preservation in Quebec.

Then, it is asked that the minimum fine for failing to obey the requirements in respect to permits shall be one hundred dollars. The present fines are mostly trifling, $2 and $5, and do not accomplish what they ought. Thirdly, it is asked that no option of fine shall be allowed the man found guilty of setting fire to the forest in order to provide himself employment at fire-fighting. Twelve months should be the minimum sentence. Fourthly, the rangers or other forest officers should have authority to summon any male adult to help extinguish fires, such persons to receive the regular remuneration.

These are all perfectly reasonable proposals. They would not entail any hardships on bona-fide settlers, but they would do away with carelessness, which, under present circumstances, is often little short of criminal. It is becoming increasingly evident that the future of our province is bound up with forest industries, and no reasonable step should be neglected which will help preserve to us the great heritage we have in our forests.

Mr. H. R. MacMillan, Chief Forester of British Columbia, now acting as Special Trade Commissioner for that Province, has reached Johannesburg, South Africa. He writes from there that he is having a hard fight against Southern yellow pine. The orders coming to British Columbia since he began his journey tell of the success of his mission, especially those received from the British War Office. It is rumored that he will go to the front.



British Columbia Railway Trestle constructed entirely of Douglas Fir in 1896.

The Question of Registering Hunters and Fishermen

A Group of Interesting Opinions From Friends of the Association Dealing With a Live Problem.

For some months past the Secretary of the Canadian Forestry Association has been gathering data regarding the feasibility of "registering" sportsmen. The object of the inquiries sent to all parts of Canada was to ascertain the views of representative persons and institutions. A few of the replies are given herewith and others will be published in succeeding issues.

That some means might be found to keep record of sportsmen, particularly fishermen, entering certain forested districts during the season of highest fire risk was the suggestion made in the Secretary's form of inquiry. It was further asked whether it would be practicable to secure the names, and probable routes to be followed, at the time the sportsmen took out his license, the information to be forwarded immediately by the license issuer, either to a central authority at the provincial capital or direct to a supervisor in the territory most concerned. It was not suggested that an entire province could be blanketed by such requirement but that sections might be tried out. If the idea was at all practicable, a well-organized body of rangers could certainly obtain valuable information from the system in regard to travellers within their patrols, and could likely eliminate some of the fire risk that annually arises from careless fishermen and hunters.

From Dr. Judson F. Clark, Vancover, B.C.: "I see no objection to this, if it can be carried out without any considerable expense. Viewing it from the local standpoint I do not see how it can be made effective on the B.C. Coast without a very considerable expenditure, but perhaps there would be some way of handling it which has not occurred to me."

A. J. Parr, General Freight and Passenger Agent, T. and N. O. Railway, North Bay: "Our thoughts are that this registration would be a decided step in the right direction and see no objections whatever to it."

Edward Beck, Managing Editor, Winnipeg Telegram: "I know of no reason why such representation should not be made to theProvincial Governments as planned."

Arthur O. Wheeler, Director, The Alpine Club of Canada: "I consider that the idea is an excellent one and I cannot see any reason why it should not be carried out as you suggest.

As you say, the very fact of registration is bound to have a deterrent effect and make the man in charge of parties much more likely to be careful, as he would feel directly responsible to the authorities.

It seems to me, however, that there might be some difficulty in registering people and parties who were making the one-day trips and also in registering parties who started from points that were not at or near registration centres; but, even if a few were missed in this way it would have a beneficial effect by keeping track of the majority.

I am of the opinion that persons, like myself, who move around frequently and at many different points in the mountains, should be created honorary or temporary fire wardens, so that they would be in a position to make inquiries of parties whom they met travelling, as to whether they held the proper registration certificate.

On general lines I very strongly approve of the idea and shal be very willing to do all in my power to assist it."

The Camp Fire Club of America (New York): "Your letter of December 7th, in relation to the registration of tourists, fishermen, hunters, prospectors and other itinerants who make occasional use of the forests, was presented last night at the meeting of the Committee on Conservation of the Camp-Fire Club of America, and was generally discussed.

The consensus of opinion was that such registration would be of benefit in preventing forest fires, and might well be put in practice if it can be accomplished without subjecting such itinerants to awkward delays in effecting registration, without requiring too close adhesion to an indicated route, and without throwing too much expense on the provincial governments.

Personal experiences in Algonquin Park indicated that under the conditions which prevail there such registration can be effected easily so far as the tourist is concerned, without great expense to the government, and with a reasonable degree of effectiveness because there is little occasion for departure from expected routes.

On the other hand, personal experiences suggested the difficulties in the way of determining with certainty the routes of hunting parties, for it was recalled that it frequently happens that the expected route of a hunting party is changed at the last moment, and perhaps after the party has actually entered the bush, because of information gleaned by the retained guide with regard to the presence or absence of game. This brought out two suggestions, one that the licensing of guides and the turning in by such licensed guides of information as to the probable routes of their parties, and others who expect to visit lands without licensed guides might be required to obtain permits to build fires on wild lands and to indicate their expected routes in the application. In the State of Maine, for example, the building of fires on wild lands by non-residents, other than licensed guides, is prohibited. This, however, often works hardship to the fisherman or hunter who, in the experience of those present, is quite as likely to be careful about fires as the average licensed guide.

This Committee is at all times glad to be kept in touch with all matters which pertain to the conservation of forests and wild life and to respond, to the best of its ability, to such requests as that made in your letter.

Yours very truly,

WILLIAM B. GREELEY,

Chairman."

Some tests of the weight of freshly cut woods have just been made by the Laurentide Company and show that brown ash weighs 50.26 pounds per cubic foot, yellow birch 64.40 pounds, white birch 55.62 pounds, elm 71.31 pounds, and sugar maple 73.36 pounds.

Although South Africa has made great progress in planting to establish its own supply of timber there is still a large demand, especially for railway ties.

Boards of Trade Back Forest Protection

Twelve of Ontario's Leading Bodies Give Support to Association's Appeals—Two Reforms Asked.

"The Board of Trade of the City of Toronto.

Toronto, Feb. 9, 1916.

The Hon. G. H. Ferguson,
Minister of Lands, Forests and Mines,
Parliament Buildings, Toronto.

Dear Sir:

"The Council of this Board, having carefully considered the subject of forest conservation and the protection of same from fire, desire to place themselves on record as being in favor of the Government adopting a rigid policy covering control of settlers' fires and the supervision of the work of the forest rangers.

"The enormous loss annually from reckless forest fires should warrant immediate action by the Government and the Board respectfully suggests that the matter be given due consideration at the forthcoming session of the Legislature.

Yours faithfully,
F. G. MORLEY, Sec'y."

Although the Canadian Forestry Association began its campaign only about two months ago to interest Boards of Trade in the forest protection movement, the fruits of the efforts are already showing. Quickly discerning the importance of forest conservation, once the matter was demonstrated as a business proposition, the officers and members of the Boards have not hesitated to take up with their governments several long-needed reforms.

Twelve of the leading Boards of Trade in Ontario dealt promptly and sufficiently with the proposals of the Association, and other Boards are quickly following their example.

Two points alone were dealt with in the initial effort: The need of some form of control over settlers' fires in the forested districts of Ontario; the necessity of reorganizing the forest protection service so as to bring about adequate field supervision and inspection of rangers.

After careful consideration of the evidence submitted by the Association in support of these contentions, the following made direct appeal to the Hon. G. H. Ferguson, Minister of Lands, Forests and Mines stating the Boards' endorsation of these reforms and requesting action along the lines indicated: Toronto, Hamilton, London, Belleville, Kenora, Fort William, St. Catharines, Prescott, Bracebridge, Smith's Falls, Chatham, and Berlin. Others will be heard from at meetings which are soon to be held.

That the keenest men in twelve communities would with such promptness endorse a movement for better protection of the forests of Ontario speaks volumes for the growth of conservation sentiment in Canada during recent years. The representations of the Boards are now in the hands of the Minister of Lands and Forests at Toronto and it is believed that his agreement to the proposals will not be delayed unduly.

On the Destruction of Drumlanrig Woods

(First published in the Scots-Magazine for July, 1803, where it is stated the verses had been found "written on the window-shutter of a small inn on the banks of the Nith," and that they were "supposed to have been written by Burns.")

As on the banks of winding Nith
Ae smiling simmer morn I strayed,
And trac'd its bonie holms and haughs,
Where linties sang, and lammies play'd,
I sat me down upon a craig,
And drank my fill o' fancy's dream,
When from the eddying deep below
Up rose the Genius of the Stream.

Dark like the frowning rock his brow,
And troubled like his wintry wave,
And deep as soughs the boding wind
Among the caves the sigh he gave.
'And come ye here, my son,' he cried,
'To wander in my birken shade?
To muse some favorite Scottish theme
Or sing some favorite Scottish maid?

'There was a time, it's nae lang syne,
Ye might hae seen me in my pride,
When all my banks sae bravely saw
Their woody pictures in my tide;
When hanging beech and spreading elm
Shaded my stream sae clear and cool;
And stately oaks their twisted arms
Threw broad and dark across the cool.

'When, glinting thro' the trees, appear'd
The wee white cot aboon the mill,
And peaceful rose its ingle reek,
That, slowly curling, clamb the hill.
But now the cot is bare and cauld,
Its leafy bield for ever gane,
And scarce a stinted birk is left
To shiver in the blast its lane.

'Alas,' quoth I, 'what ruefu' chance
Hast twin'd ye o' your stately trees?
Has laid your rocky bosom bare?
Has stripp'd the cleeding aff your braes?
Was it the bitter easten blast,
That scatters blight in early spring?
Or was't the wil' fire scorch'd their boughs?
Or canker-worm wi' secret sting?

'Nae eastling blast,' the Sprite replied—
'It blaws na here sae fierce and fell,
And on my dry and halesome banks
Nae canker-worms get leave to dwell:
Man! cruel man! the Genius sigh'd,
As through the cliffs he sat him down:
'The worm that gnaw'd my bonnie trees,
That reptile wears a Ducal crown.

At the government nurseries located at Berthierville, for the Province of Quebec, at St. Williams, Ontario, for the Province of Ontario and at Indian Head, Saskatchewan, for the Dominion Government, and at Sutherland, Saskatchewan, stock will again be available this year. The number of trees shipped from Indian Head has steadily increased from over two and one-half million in 1910 to about three and three-quarter million in 1914. These trees are distributed among farmers throughout the prairie provinces mainly for shelter belts, woodlots and the beautifying of grounds around buildings.

"Proper Reforesting"

By Ralph H. McKee,

Head of Pulp and Paper School, University of Maine, Orono, Maine.

The planting and growing of trees deserves the same care and consideration as the planting and growing of other crops. The aborigines grew varieties of wild wheat and oats. The present day up-to-date farmer uses carefully chosen hybrids and as a consequence has varieties that will yield more than sixty bushels of oats and thirty of wheat per acre under conditions which, with the original wild varieties from which these crosses ("hybrids") were obtained, the yields would be but four bushels per acre for the oats and two or three for the wheat.

Almost all our crop plants cultivated to-day, whether grown for their roots, seed, fruit, stalk or flower, have, by similar crossings of the original wild varieties ,been developed to give yields from five to thirty times that of which the original wild varieties were capable.

Faster Growers.

With trees, the present method of reforestation is to plant seedlings of the original wild varieties and the trees obtained are naturally no larger and no faster growing than the wild ones from which they sprung. I wish to plead to-day for the introduction of the modern scientific methods, that have been found valuable with other crop plants, to the growing of trees for wood for making paper pulp. In other words, I wish to plead for a careful study of the hybrids formed by crossing the varieties of trees that are related to the woods at present used for pulp wood, with the expectation that the hybrid varieties thus formed will be very much faster growers and make at least as good quality pulp wood as any we now know.

Enough has been done by Burbank, Henry, and others on the crossing of trees for other purposes to show that this expectation of increased size and speed of growing has a strong basis in its favor.

Henry has called attention to the fact, that first crosses of trees, as of other plants, are remarkable for their size, rapid growth, early and free flowering, longer period of life, the ease with which they can be multiplied, and in all probability, their comparative immunity from disease.

Burbank produced in 1897 a hybrid walnut as a cross between the European walnut and the California walnut. Three of these trees in fifteen years each measured eight feet in height and six feet in girth. In these the timber when cut showed annular growth rings one inch in width.

Walnut Crosses.

Another cross between the California walnut and the Atlantic coast walnut was at sixteen years one hundred feet in height and nine feet in girth. This, you will agree, is an astonishing size for such ordinarily slow growing trees as walnut.

These walnut crosses were not made for lumber, but only for their fruit and indeed so far have continued to be grown solely for their fruit.

Henry states that in England a certain hybrid willow "often attains, in fourteen or fifteen years from the

planting of the sets, fifty to sixty feet in height and three and a half feet in girth." One at fifty-five years was a hundred and one feet in height and eighteen feet in girth.

To those interested in pulp wood, the natural thing to do is to think of spruce and poplar. Spruce is slow growing and slow to flower (30 to 40 years under forest conditions) and so far as I know, there have been no crossings of spruce attempted. With poplar, on the other hand, the trees grown from slips will flower when about four years old. This and the fact, that the flowers are easy to artificially fertilize as compared with spruce and similar trees, make poplar a much easier tree to handle experimentally.

Effect in Poplars.

There are a few cases of crosses which have been made between varieties of poplars and you will be interested to learn regarding them.

There is a wonderful hybrid poplar growing at Metz, Germany, which in 1913, when eighty-one years old from seed, measured a hundred and fifty feet in height and twenty-five feet in girth at five feet above ground and at last accounts seemed to be still growing steadily. A younger tree, a cutting from the tree just mentioned, was at forty-three years old, a hundred and forty feet high, and sixteen feet in girth, and would cut 7,000 board feet of lumber. In the case of another hybrid poplar, which was unrelated to those just mentioned, the cutting was forty-five feet in height and eight inches in diameter fifteen years after planting. This was on a poor shallow soil. These were accidental hybrids. There is no reason to think they are the most rapid growing that would be obtained if crosses were made systematically.

Ten Feet in 27 Months.

Henry by artificial fertilization obtained a hybrid poplar that in twenty-seven months was ten feet one inch in height. One appreciates what this means when one considers that many forest trees at twenty-seven years, instead of twenty-seven months, are scarcely more than a third this height.

Given a single satisfactory tree, there is no difficulty in getting in a few years thousands, or even millions, of trees from it, each as good as the original hybrid.

The practical solution of the problem will be to get together specimens of the twenty-five or thirty varieties of poplar known in this country and abroad, cross them, grow the resulting hybrids, and test the woods obtained from these hybrids for pulp-making qualities. From the results obtained, choose the hybrid that in growth of wood, quality of wood considered, is the best and, using this tree as a source of stock, reforest the cut over pulp wood lands.

Cost of Experiments.

To carry out such a programme will take skilled scientific workers and some time. As I estimate it, it will require, to cover all expenses, about $7,000 a year for six or seven years to get and test the possible hybrids and to get seedlings or cuttings to begin actual planting on forest lands.

In this connection it may be worth calling the attention of the younger generation of paper-makers to the fact, that twenty-five years ago, poplar was more used than spruce for making ground wood pulp for news paper. It is well known that to-day poplar is our most used wood for soda pulp. Judging from an article of a month ago in the Pulp and Paper Magazine of Canada there is a possibility of poplar becoming in the near future an important wood for use in sulphite mills, if it can be had at a less price per cord than spruce. This sulphite pulp from poplar is obtained in good yield and meets the class of needs met in England by esparto pulp.

Would Research Pay?

To make the same tests with spruce will not be as quick nor as easy as with poplar, for methods of technique will have to be developed, and the experiment itself will be slower to come to completion. Even if the cost and time were double that given in the case of poplar, it would stil be very worth while. A forest with pulp wood of first quality, each tree of which increases two inches in diameter each year, is well worth working for. A single automobile company in this country expended last year $500,000 in research. Should a company making pulp hesitate to invest $7,000 a year for a few years when there is an even larger prize in sight?

Cedars of Lebanon

There are only about four hundred of the Cedars of Lebanon left. High up on the rocky slopes, Hadrian sculptured his imperial anathema against all who should cut these sacred trees. The Maronite peasants almost worship them and call them the "Cedars of the Lord," and a recent governor of the Lebanon has surrounded them by a great wall, so that the young shoots may not be injured by roving animals. Yet, century by century, their number grows less.

But these few are of royal blood. They are not the largest of trees, though some of the trunks measure over forty feet around. Their beauty lies in the wide-spreading limbs, which often cover a circle two or three hundred feet in circumference. Some are tall and symmetrical, with beautiful horizontal branches; others are gnarled and knotted, with inviting seats in the great forks, and charming beds on the thick foliage of the swinging boughs. The wood has a sweet odor, is very hard, and seldom decays. The vitality of the cedar is remarkable. A dead tree is never seen, except when lightning or the axe has been at work. Often a great bough of one tree has grown into a neighbor, and the two are so bound in together, that it is impossible to say which is the parent trunk. Perhaps the unusual strength and vitality of the cedars are due to their slow growth.

When a little sprout, hardly waist-high, is said to be ten or fifteen or twenty years old, one cannot help asking, "What must be the age of the great patriarchs of the grove?" It is hard to tell exactly. There have been counted, with the aid of a microscope, more than seven hundred rings on a bough only thirty inches in diameter. Those who have studied the matter deeply think that some of these trees must be more than a thousand years old. Indeed, there is nothing wildly improbable in the thought that perhaps the Guardian, for instance, may have been a young tree when Hiram began cutting for the temple at Jerusalem.

Annual Fees Now Payable

Members of the Canadian Forestry Association are respectfully requested to remit the annual fees as early as possible. A memorandum was sent to every member during the past month and it is desired that as far as possible the returns shall reach the Treasurer before the middle of April.

The attention of members is also directed to the new "Contributing Membership," by which those wishing to aid the 1916 programme of forest protection campaigning in a special way are enabled to do so.

St. Maurice Protective Association

The St. Maurice Forest Association, Limited, held their fourth annual meeting recently at the Place Viger Hotel, Montreal. The report of the president, Mr. S. Laurence de Carteret, stated that the scope and influence of the association had increased materially during the past year, and the introduction of new methods have raised the degree of efficiency attained.

Most satisfactory advances have been made in eliminating indiscriminate slash burning on farmers' lots in clearing land. Use of burning permits in an experimental way during the season of 1914 gave such encouraging results that in 1915 a widespread effort was made throughout the territory of the association to have all slash in clearings burned under the supervision of fire rangers in conjunction with burning permits.

No forest fires occurred from burnings conducted in this manner, and these results have carried much weight with the Department of Lands and Forests when the desirability of the use of burning permits throughout the province has been under consideration.

It has been suggested that the members of the association issue written instructions to their woods employees advising them that preventing and extinguishing fires is their first duty, and the president suggested that a standard set of instructions to employees pertaining to forest protection, for use by all the members of this Association should be drawn up.

During the past fire season the total number of fires was 27 per cent. less than during that of 1914, while the number of fires requiring extra labor was reduced 20 per cent. Several hundred miles of portage and trail had again been cut and cleared, making communication easier and quicker. Nine more lookout stations were constructed, making a total of twenty-three.

Good trails had been cut to all these stations with the intention of connecting them to the nearest telephone lines.

The financial statement showed receipts of $37,757.45 and expenditures of $36,509.52, leaving a balance of $1,247.93. The regular assessment for patrol and general expense was a quarter of a cent per acre, totalling $19,731.94. On December 2nd a special assessment of one-tenth of a cent per acre was voted for general uses, principally to cover the expenses incurred in fighting fires. The area patrolled held by members of the Association was 7,892,776 acres, to which must be added the settled districts adjoining, but from which no income is derived, and Government lands not under license. The expense in fighting fires during the past season was only 56 per cent. of that during the season of 1914, and a large percentage of the timber killed by fire in 1915 is so located that it can be logged during this and next winter.

The following officers were elected: President, Mr. Ellwood Wilson, Laurentide Company, Limited; vice-president, Mr. Robert F. Grant, St. Maurice Lumber Company; directors, Messrs. Joe. M. Dalton, St. Maurice Paper Company, Limited; Charles LeBrun, Belgo-Canadian Pulp and Paper Company, Limited; S. Laurence de Carteret, Brown Corporation; J. H. Dansereau; secretary-treasurer and manager, Mr. Henry Sorgius.

Swiss Forest Management

Old Method of Clear Cutting With Plantations Gives Place to Natural Regeneration Through Careful Cutting.

(Continued from previous issues.)

At the beginning of the 19th century the question of surveys was taken up seriously by the Swiss authorities. A triangulation survey of the country has been completed but more detailed surveys have been carried out over only 35% of the territory, and a general plan has been laid out for this work. The division of Swiss lands is as follows:

Total area	10,330,997 acres.
Forest	2,348,057 "
Agricultural	5,377,022 "
Unproductive land	2,605,918 "

That is, 25.2% of the land is unproductive; 22.7% is forested, and the remainder is devoted to agriculture. The large percentage of unproductive land is of course a result of the mountainous nature of the country. The percentage of forest in other European countries is: Germany, 25.9; Austria, 32.5; Hungary, 27.8; France, 18.7; Belgium, 18.3; Sweden, 47.8. No great increase in the area of the forest can be expected and the recent reforestation on new lands has been for protection against floods and avalanches. According to the census of 1910 the population of Switzerland is 150 persons to a square mile or .62 acres of forest per person. Switzerland imports much wood. Where the average of the forest area per inhabitant is below about .90 acres the importation of wood is greater than the export.

Of the forest land the state lands are 106,545 acres, the communal and municipal forests, 1,597,687 acres, and the individual forests 643,825 acres. Thus about three-fourths of the forest is a public domain.

Quality of Swiss Forests.

The character of the forest varies according to location. To the north lies the range of the Jura mountains, a limestone ridge rising to a height of over five thousand feet. On this ridge, forested to the summit, are mixed forests of deciduous-leaved trees and conifers. Beech has the most important role in these forests. On the sunburned and dry slopes of the hills the beech preserves the soil against drying, thanks to the shade and its thick carpet of leaves. Its shelter permits the growth of other species:—ash, maple, fir, spruce. On the south slopes beech is almost always accompanied by Scotch pine but on the more fertile and cooler northern slopes the fir and spruce are found.

The central valleys lying between the Jura and the Alps contain the principal areas of agricultural land, the soil is better, and the climate milder. Naturally the forest is more varied and deciduous-leaved trees predominate. Oak, beech, hornbeam, ash, maple, elm, alder, willow and poplar are found generally. Fir and Scotch pine are also frequent and spruce, which seems to have been more recently introduced, has an important place.

As the Alps are approached spruce and fir increase rapidly in importance. It is along the northern border of the Alps that these species reach their best development and become dominant. From about 1,500 M. altitude spruce remains alone of these two species. The following species attain their maximum development in the Central Alps: larch,

Cembra pine, mountain pine, and also the Scotch pine. About 70% of the forest is of coniferous species; 40% is spruce, 20% fir, and 10% pine. 30% is deciduous-leaved trees and 25% is beech.

Seeding and Coppicing.

In the management of the Swiss forests nine-tenths are handled on a system of reproduction of high forest by seeding, and the remainder on a system of coppicing. Coppicing is suited best to good soils and is most in practise in small private holdings.

The method of clear cutting and reproduction by plantations was introduced by Swiss foresters who from 1820 had begun to study forestry in Germany. Fir and beech, which do not resist frost well in their first years, were thrust aside and spruce was almost solely planted. The ease and rapidity with which it grew and the usefulness of the wood also made it a favorite. The old stands of broad-leaved trees—oak, beech, ash — mingled with fir, gave place gradually to pure stands of spruce. Lands fallen out of agriculture were planted with spruce. Natural regeneration was little by little abandoned and maintained only in the mountain forests.

But the inconvenience of a method so ill-adapted to the natural conditions soon appeared. In the plantations of spruce there was found at the age of 50 to 60 years a diminution of growth. And then rot began to make disquieting progress. The ill effects of the latter decreased in importance when the spruce grew among other species, when special cultural measures were followed, or when growing at higher altitudes. By the forced cutting of trees broken by wind or snow or attacked by rot the stands were thinned and lost their resistance. They had often to be felled before the proper time. The soil becoming impoverished and regeneration was difficult. To all these factors were added the insects which, in Germany and Austria, had completely destroyed great stretches wooded exclusively with spruce.

Reaction against this method soon followed and it has had its day. The treatment generally applied today is as follows: It seeks to preserve and to increase the productive power of the soil by a judicious mixture of species and maintaining the soil cover. It seeks regeneration by natural methods. The annual cut should be carried out on the oldest trees, those of defective form or of feeble growth so as to increase the volume and the value of the old stands remaining.

Sustained Yield.

The rotation which is generally the rule in the public forests is from 80 to 100 years in the central valleys, 100 to 120 or 140 years in the Jura, and 140 to 180 years in the forests of the high mountains. In all the public forests the principle of sustained yield is adopted which means that the annual cut does not exceed the growth. In order to fix this exactly, complete inventories of the standing timber should be made regularly. The principal revisions of inventories suffice every 20 years in the mountains but is considered necessary every ten years in the most productive forests. Indeed everywhere where the treatment of the forest is well understood it has been determined that the sustained production of the forest increases and that at each revision the annual possibility can be increased, and generally the greater value of a single annual cut suffices to largely cover the cost of the inventory.

The production of the public forests is 40.38 cubic feet per acre, the expenditure $1.44 per acre, leaving a net revenue of $2.72. The production from the 1,704,232 acres of public forest is 69,188,000 cubic feet, and the total for the whole country 95,310,000 cubic feet per annum. Most of the wood is consumed in

the country. The importation in 1911 was 30,005,000 cubic feet and the export 4,236,000 cubic feet. In spite of the use of coal, gas, electricity, iron and concrete, the consumption of wood increases unceasingly, especially of wood for industries and particularly of lumber. To meet this demand it is urged that the production of the forests should be increased by proper management. It is estimated that the production of 40 cubic feet per acre could be increased by 30 cubic feet per year, or nearly doubled.

Campaigning Through Boy Scouts

The Boy Scout Forest-Book, issued last month by the Canadian Forestry Association and presented to most of the Boy Scouts in Canada has met with a gratifying reception. Letters heartily commending the undertaking have reached the Secretary from many sources and applications for the booklet are being received from all parts of Canada and even remote sections of the United States where newspaper and magazine notices had first gone.

Twenty-seven photographic illustrations and sixteen pages of reading matter have been so arranged as to appeal first of all to the boy's sense of what is interesting and secondly what is most important that he should know. Newspaper comments upon the production have been laudatory in tone and a few excerpts are given as examples:

Montreal Herald: "It is a happy idea of the Canadian Forestry Association to get out a 'Boy Scout's Forest-Book' and present a copy to the members of the Scout Movement in Canada. . . . It certainly will arouse the interests of young minds in the value of the national forests and make the lads feel that the trees are the friends of both the individual and the community. We congratulate the Association on this further evidence of aggressive work along most valuable lines."

Victoria, B.C. Times: "This Forest-Book might well be in the hands of every citizen of Canada for it comprehensively, yet simply, points out the stupendous wastage of timber which occurs each year through forest fires as the result of carelessness . . . In the hands of the Boy Scouts this little volume should have great educational value and scout masters cannot over-emphasize the importance of the warnings it contains."

Pulp and Paper Magazine: "In the thirty-two pages of text and illustration, the boy is made acquainted with the Canadian forest as a personal and national necessity. The subject is handled from a new angle."

Toronto News: "It is made especially attractive to a boy as it deals with a subject that is almost invariably interesting to every healthy upstanding youngster."

St. Thomas Journal: "Mr. Black has written a helpful thing in 'The Boy Scout Forest-Book.' It is issued as part of the Association's educational propaganda for forest protection. The young reader is given the business reasons for putting an end to our plague of forest fires."

Copies of the booklet have been mailed to all members of the Canadian Forestry Association.

The Secretary is now preparing an edition in French for distribution to many thousands of senior boys in Quebec Province. It is possible that, owing to the relatively few Boy Scouts in the French-speaking population of Quebec, the name of the booklet will be altered to "The Canadian Boy's Forest-Book," and some of the illustrations and reading matter made to focus more directly upon Quebec's forest development.

A "Forestering Battalion"

The war has given rise to many novel incidents but perhaps none stranger than the proposed raising of a battalion of woodsmen to cross the seas and help cut down some of Britain's home forests for war purposes. The official announcement as contained in the newspapers read as follows:

A Canadian forestering battalion has been asked for by the War Office and steps have been taken immediately by Major General Sir Sam Hughes to form it. It will be in command of Lieut.-Col. Alexander McDougall of Ottawa, the well known railway contractor. The majors of the battalion will probably be Gerald White, M.P. for North Renfrew, and B. R. Hepburn, M.P. for Prince Edward.

Canadian woodsmen are wanted at once in Great Britain for timbering operations in connection with war requirements. Lumber is now at an almost prohibitive price in the Motherland, and ocean rates on lumber from this side are so high as to practically stop export from here. In Great Britain there are still large resources of standing timber which can be cut down and utilized for building operations, trench construction work, etc. The men from Canada know the business and will get to work within a month or so on the job.

It is planned to raise companies of experienced woodsmen from British Columbia, from Alberta and northern Saskatchewan, from the Ottawa Valley, and from Quebec and New Brunswick. A number of prominent lumbermen and contractors have agreed to co-operate in the recruiting of the new battalion and these modern cours-de-bois will form one of the most picturesque and at the same time most serviceable of the Canadian battalions for overseas service.

A Lesson in Consequences

(From Toronto "Globe.")

The sweeping of the bison from teh Western plains is well-nigh parallel by the removal of the virgin forests from older Ontario. Men are still living who can remember when the greater part of the southern half of the Province was covered with timber of a class which commands famine prices to-day. The sturdy oak, lordly pine, towering elm, and beech, maple, ash, and basswood were found in abundance almost everywhere, while in special localities walnut was also common. Untold quantities of this timber were burned in log heaps; more of it was sold for a song. To-day so little of the original forest remains that some of the most valuable hardwood cannot be obtained in commercial quantities in older Ontario; a few years ago, in a period of fuel scarcity, the stumps of pine trees sold for fuel at a higher price than was secured for the trees which grew upon them.

The wholesale destruction of trees which occurred in the early days of settlement is not the only evil in the case. The Province has been so stripped of forest protection that creeks are drying up and the supply of well water has in many places been endangered. In addition to this, the clearing of light soils, unfitted for agricultural purposes, is leaving exposed sandy wastes which are a menace to better land in the neighborhood. The lesson taught by the experience of older Ontario should not be lost on the new area now being opened in the north. In the portion of the Province which has been overcleared a vigorous policy of reafforesting should be adopted as soon as normal conditions are restored after the war.

The Results of Public Lectures

The public lecture programme involving two lectures daily was carried out by the Secretary during the two weeks ending Saturday, February 26th, the territory covered representing Winnipeg, Port Arthur, Fort William, and Sudbury.

The newspapers at these points gave unstinted publicity to the propaganda in advance of, and during, the Secretary's visits. Columns of space were devoted by the Winnipeg newspapers to forest conservation matters in the form of interviews, reports of the lectures, and editorially.

The senior students of technical schools and collegiate institutes were frequently assembled for an hour, while the lecturer outlined the story of Canada's forest industries, the importance of maintaining the storehouse of raw materials, the damage wrought by forest fires on standing timber and stream protection, the work of fire rangers, etc., etc. The attention given was invariably good, and one-hundred pictures on the screen accentuated the impressions of Canada's forest needs.

At Winnipeg, the Secretary was privileged to discuss with Hon. T. C. Norris, Premier of the Province, and the majority of his Cabinet Ministers the desire of conservationists for better co-operation between provincial authorities and those responsible for the care of the forest reserves. It was pointed out that the reserves required protection from settlers' fires on their borders and had suffered greatly from this source, that a policy of careful guarding and development by the Dominion Forestry Branch would inevitably bring great benefits to the surrounding country in increased supplies of wood for settlers and ultimately the starting of new industries. The Premier and Ministers gave the presentation a courteous hearing.

Other lectures have been arranged for Cobalt, Sault Ste. Marie, London, Hamilton, Toronto, Montreal, Brockville, and other centres.

Fighting Forest Insects

Some little time ago Canadians were startled by the news that an outbreak of forest insects had occurred in Stanley Park, Vancouver, and that there was danger of a great part of that magnificent timber being destroyed. At the last monthly meeting of the Foresters' Club of Ottawa held at the University Club, Mr. J. M. Swaine, entomologist for forest insects in the Department of Agriculture, told how that outbreak had been first checked, and then beaten off. This came as an incident in his address on forest insects in Canada, which address was illustrated by lantern views and made still more plain by the exhibit of samples of the wood and bark of destroyed trees, and by specimens of the insects which did the damage.

Mr. Swaine told of his work in the past three years to learn the life history of insects not yet fully studied and to devise and apply measures to combat their destructive work, and to save timber areas that had been attacked.

There was not a dull or uneducative minute in the whole lecture.

The great scope of the work was indicated by Mr. Swaine's references to work in New Brunswick, Quebec, Ontario and then across to the Pacific slope; while one of the greatest "finds" in regard to one of the spruce-destroying insects was made in a pile of three million feet of sawlogs on the shore of Lesser Slave Lake in Alberta. The importance of the subject is so tremendous and so much interest was aroused that it is not unlikely Mr. Swaine will be asked to address the club again with particular reference to one part of Canada, and the insects which endanger the forests in that part.

The chair was occupied by the president of the club, Mr. R. H. Campbell, director of forestry, who conveyed the thanks of the club to Mr. Swaine. He also explained that in addition to those who originally formed this club, lumbermen and others interested in forestry might become members and participate on the same basis. There were a number of visitors, including Dr. C. Gordon Hewitt, Dominion entomologist; Mr. B. M. Winegar, of the C.P.R. department of natural resources, Montreal; and Mr. Chrystal, assistant to Mr. Swaine in his forest protective work.

Lasting Qualities of Douglas Fir

The house shown in the picture was built in 1851 entirely of Douglas Fir, except the roof which was of cedar shingles. It was erected by the Hudson's Bay Company near Victoria, B.C. There are practically no parts of the building that have had to be renewed.

Forestry and the Lumber Industry

How the British Columbia Government Grappled With Problem of Utilizing the Stores of Forest Wealth

By W. T. Van Dusen,
British Columbia Forest Service.

Forestry is a very broad word and has been used to embrace a wide range of activities. I would preface my remarks with a definition of Forestry as I understand it. Forestry may be defined as the best management of a forest estate keeping in mind both present and future interests.

There are two great classes of forested properties. Protection Forests and Supply or Timber Forests. The forester must always keep in mind in the management of forests the primary object to be obtained. Protection Forests are very important in some of the European countries but as the Timber Forest is the important forest of North America, at the present time, as they bring population, wealth, prosperity, I will limit my remarks to the Commercial Forest.

Forestry was first practised and has come to its highest development in European countries. There, even from the very first, the manager of a Forest Estate had no difficulty in selling his product at a sufficient price to net a profit on his operation. The great demand of the wood-using industries constituted a large and steady demand for the product of the forest. In the same way, the dense population created a steady demand for the product of the various wood manufacturing establishments. So, we find in Europe that the Forester on account of the demand for his product has confined his activities to the growing of timber crops. To do this to the best advantage, however, he must keep in close touch with the market which consumes his product and if he finds his market is undergoing certain changes, he must either devise other ways of marketing his product or change the character of his product to suit the altered market conditions.

B. C.'s Fire Protection.

Conditions are entirely different in North America. The immense virgin forests have been exploited by the lumberman (rightly so to my mind) and the Forester has come on the scene after considerable portion of North America's standing timber has been cut. It became his duty to see that the forest resource was not over cut, was not destroyed by fire and to handle the forests for the benefit of the people. In North America, of course, forestry is confined almost entirely to state effort.

Now, I want to tell you about forestry and the lumber industry in British Columbia.

The first thing to be done was to adequately protect the forests of

B. C. from the enemy of forests all over North America—fire. This has been practically accomplished. Do not let me be misunderstood. We still have forest fires, many of them, but as in a well patrolled city, the large majority do not get past the incipient stage and the annual loss through this source can be calculated fairly closely. After protection comes utilization of the forest wealth.

Loss of Mature Timber.

The Forest Branch after careful investigation covering three years finds that there is at a conservative estimate 400 billion feet of merchantable timber in B. C. This estimate will be fully borne out, I believe, when the report now being secured by the Commission of Conservation is issued. At the present rate of cutting this would last over two hundred years. But there is growing each year, at least 5 billion feet of which only from one and a half to two billion is being used. The balance is a total economic loss. This is a waste which, by all the rules of conservation, should be stopped and if it is possible to stop it, the Government of B. C. is going to stop it. We cannot allow such an economic waste, if it is possible to avoid it, especially when Canada and the Empire is at war. The same sentiment which prompts Canada to support the Empire with her men and money should stimulate those who do not go to fight the Empire's battle on the fields of Europe to economize, conserve and utilize the nation's natural timber resource, so that the forests of Canada can play their part in making prosperity and so help financing the war. The only way is to find larger markets for our forest products.

Problems of Selling.

We have logging and milling facilities to harvest the total annual growth. In fact, overproduction and sacrifice prices are an old and almost chronic trouble in the lumber industry of North America. In addition to overproduction we have had decreased consumption. The per capita consumption of lumber in North America has always been very high—far higher than in England or Europe in general—and probably it is only to be expected that it would decrease somewhat as time goes on. Many substitutes are now on the market, and for some purposes some of them are unquestionably superior to wood. But in many cases they are sold by aggressive advertising and salesmanship for purposes where wood is far superior; for example, substitute roofing material versus British Columbia Red Cedar Shingles. Lumbermen are now beginning to see that in order to keep its proper place in the markets, wood must be advertised and sold more efficiently, and better service given to the consumer.

Another factor which has reduced the consumption of lumber is the decrease in building per capita. Some claim that a good deal of this money has gone to buy automobiles—in other words, many people are buying new automobiles instead of new houses. The great increase in tenant farming is given as another reason. The general business depression of the past year or so, and the effect of the war on foreign markets and shipping all aggravated the situation.

I cannot go into detail concerning what we are doing to secure increased markets in the time at my disposal, so I will just briefly mention the various lines that the work has taken.

Commissioners at Work.

(1st) Mr. H. R. MacMillan, Chief Forester of B. C., was sent on a world tour by the Department of Trade and Commerce. He is at present in India having visited the United Kingdom, France and South Africa and will visit Australia, New Zealand and China before he returns.

(2nd) B. C. Lumber Commisioners have been placed at London, Eng., Regina, Sask., and Toronto, Ont. The Toronto office is in the Excelsior Life Building, at the corner of Adelaide and Toronto Streets.

(3rd) A quarter million pamphlets have been issued for distribution to the Prairie farmers, giving detailed plans for all kinds of farm buildings together with complete specifications.

(4th) A series of timber pamphlets are being printed describing the wood products which B. C. has for sale. These are for distribution to importers, architects, engineers and large users of wood in the markets that B. C. hopes to reach.

(5th) The Forest Branch at Victoria are prepared to forward to all lumber producers of the Province any inquiries received from prospective purchasers.

I might jsut add here that great drawbacks to the development of overseas markets has been great scarcity of tonnage and the fact that up to the present time almost the entire foreign business of the Pacific Coast has passed through the hands of San Francisco brokers. Steps are being taken in B. C. to create a local Merchant Marine, which will enable our lumber to compete in the world markets without the handicap of passing through San Francisco. In this work the Foresters of B. C. are working hand in hand with the lumber industry. And in this close co-operation there is being formed a basis of sound understanding and appreciation of each other's difficulties that will be a sure foundation on which to build a far-sighted provincial forest policy having in view the best and most efficient utilization of our timber resource.

Co-operation the Key-note.

Forestry and Lumber Industry are linked up almost inseparately in actual practice and the thought I wish to express before closing is this:—

On the North American Continent, it is my conviction that the Foresters having the management of State Forest resources in their hands should build a solid foundation of mutual understanding and hearty co-operation between all directly interested in the forest and secure by these efforts a public opinion on which there can steadily be built up a strong healthy forest policy.

Foresters, Lumbermen, Pulp and Paper Manufacturers and timber owners are allies who must work together to secure lasting results.

Monument to a Tree

Perhaps one of the most curious monuments in existence has recently been built in Ontario by Canadians, says "The Popular Science Monthly." The farmers have just erected a marble pillar to mark the site on which grew a famous apple tree.

"More than a century ago a settler in Canada named McIntosh, when clearing a space in which to make a home in the wilderness, discovered among a number of wild apple trees one which bore fruit so well that he cultivated it and named it McIntosh Red.

"The apple became famous; seeds and cuttings were distributed to all parts of Canada, so that now the McIntosh Red flourishes wherever apples grow in the great Dominion. In 1896 the original tree from which the enormous family sprang was injured by fire, but it continued to bear fruit until five years ago. Then, after 15 years, it died, and the grateful farmers have raised a marble pillar in honor of the tree which did so much for the fruit-growing industry of their land.

"The story of this apple tree illustrates the African proverb that, though you can count the apples on one tree, you can never count the trees in one apple."

War's Effect on Shade Trees

By F. McVickar.

Mr. McVickar is a well-known Canadian Forester and has been serving in France for many months.

I am sending all I could scrape up about the effects of war on forests during the two months I was in France. In the army on service a man's time is never his own, and his movements are also very much never his own, and his movements are also very much restricted. Also when in the areas affected one is generally as close to mother earth as he can get during daylight hours; and consequently one's horizon is very circumscribed, especially in a very flat country.

"The sound of flying bullets and the burst of shells too tends to keep one's mind occupied with problems which at ordinary times are more interesting to woodchucks, badgers and the like than to foresters. However, now that everybody is talking of the war, and thinking of the war above all else, my little effort may not be entirely unwelcome.

"Unfortunately the country in which our force is operating is almost devoid of woodland. However, farther south in Alsace and Lorraine there are extensive forests, but of course I couldn't get near them. Photos are absolutely out of the question. Cameras are not allowed out there to any except a few generals, etc.

"I have been in the trenches in Northern France; and although I didn't see enough of the effect of military operations on forest land to warrant venturing on anything like a technical discussion of the subject, a few of my impressions of this side of warfare may not be entirely amiss. First, I would like to say that while these operations are going on it is pretty nearly impossible to make any observations of value on this subject. This, I hope, will be made clear in the remarks which follow.

"The part of the line held by the British runs through a very low, flat country largely taken up by farming. It boasts of nothing but small patches of wood scattered about here and there.

"The operations that have taken place on this territory may be grouped under two heads; the first heading covering those operations incident to the advance toward Paris at the beginning of the war, and the second covering the almost stationary siege warfare of the present stage of the war.

"The damage caused by the first-class of operations is very slight in this part of the country. Chiefly because the patches of wood are isolated and because owing to the general scarcity of wood litter and dead branches are kept cleaned up. Consequently the woods are not easily burned. Also at that stage of the struggle bodies of men moved largely along the roads, and artillery fire was not of long enough duration in one place to do much damage. Earthworks then were not very elaborate and poles were not used so much in their construction as at present.

"The effect o fthe operations coming under the second head are much more noticeable for the simple rea-

son that the fighting has for many months been confined to a rather narrow strip of country.

"One might subdivide this area into two zones: the zone of constant bombardment, that is the zone of the trenches where there is an almost constant hail of shells and the zone of intermittent bombardment, this being the territory where the local range heavy guns drop a shell now and then, searching for the opposing artillery or sweeping the roads in search of transports or columns of troops.

"On the areas covered by the constant fire there are no living trees or even large shrubs left; in fact I've seen small patches where it seems that even the grass blades must be pretty well frayed out. Here, naturally in daytime, one keeps down in the trenches as much as possible, and in the dark one is too busy perfecting and repairing one's particular portion of trench to look around very much.

"However, by peeping out very cautiously in the daytime one may get an occasional glimpse of what used to be a patch of woods or a few isolated trees.

"All species look pretty much the same now; a stub more or less split up, with one or more bits of broken branches still clinging on near the top. There are no leaves, twigs, or small branches remaining, and even most of the bark has been whipped off by flying metal.

"The earth is generally broken up and pitted very generously with shell craters. Now the explosion of a good many of these shells, for instance those containing lyddite, generate fumes which stain everything in the immediate vicinity; sand bags, clothes, and the very earth itself. As far as I could make out these fumes constantly settling on the soil will kill, or at any rate damage, its vegetation, and probably will reduce its fertility, for a time at least. However, when the war is over our French and Belgian friends will be able to tell us all about this.

"As to the effect of the gas on the soil, I have never been in the gassed country, so do not know much about it. They say that it kills the leaves on trees and shrubs.

"The long range bombardment of the second class doesn't do any appreciable damage to woodlands because the shells do not cover much of the ground and are generally dropped on other things than trees.

"A good many poles are taken from this area immediately behind the trenches for use in earthworks. This undoubtedly takes a good deal of material from the future yield of the stands. However, owing to the great size of the area they are removed from it is not very noticeable in any particular spot.

When the time of reconstruction comes there will be an increased demand for timber for a time. All buildings, although in Europe largely made of brick or stone, require some wood in their construction. Most of the buildings close to the scene of the present operations will have to be completely rebuilt. Wood goes into railway construction, and a great many public works; all of which have suffered very heavily wherever near the trenches.

"Hence we will not only have damaged forests on the areas affected, but also a need for timber which for some time will be much greater than before the war."

A Soil Survey

(From "The North Woods" of St. Paul, U.S.A.)

The State Development Committee, which met in St. Paul early in December, and the Northern Development Association, which met in Bemidji a week later, both passed resolutions favoring a soil survey, "to be made by those who want the land used for agriculture." One of these resolutions implies, and the other one states explicitly, that the foresters should not have anything to say about the soil survey.

We would call attention to the fact that the foresters have never asked for any part in this soil survey and do not want any part in it. We have always stood for a survey by experts in land classification, a classification based on scientific methods and not on prejudice. This is the only basis on which a soil survey would be worth while. The object of a survey should be to determine the use to which the land is best suited. A survey with any other object is merely a fake which uses up the people's money and accomplishes nothing.

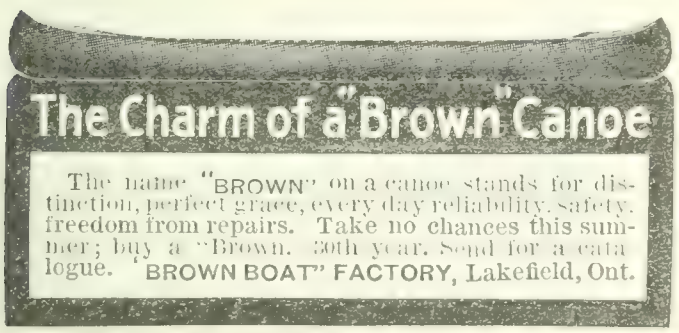
We regret the narrow policy that the development associations have adopted because it means a serious setback to the best economic development of the state. It means that thousands of acres of land of little or no agricultural value will be opened up to settlement and branded with the state brand as farm land. Thousands of families will move on to it, wear out their lives trying to compete with the real farm lands, and fail miserably. In the end the land will revert to the forest, survey or no survey. The state has lost the use of the land for many years and the labor expended on these lands has been worse than wasted.

There are millions of acres of good farm land in the state untouched. Why not use these and let the other lands produce timber until they are needed for farms. They can be changed into farm land just as well then as now and will be producing something in the meanwhile.

However, if there is no chance for an impartial, scientific soil survey, by all means let us have one on the basis that the development associations purpose. A definite classification will be better than none, even if it is all wrong; economic laws will correct it in time, though at a tremendous loss to the state.

A bill is to be introduced in the coming session of the British Columbia Legislature authorizing the government to build thirty four-masted schooners to be fitted with auxilliary Diesel engines to be used in the lumber carrying trade.

"Only a man in a forest green,
Only a match that was dropped unseen,
Only a flame, some leaves and wood,
And, only a waste where the forest stood."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Wisdom in Replanting

(Toronto News)

Because grandfather believed that the forest was infinite, we act as if it were. Yet the casual and occasional use of our eyes would prove the contrary. Forests have almost disappeared in the settled portions of Ontario. Wasteful methods of lumbering are clearing them away with appalling rapidity in the unsettled areas. The Laurentide Company, at Grand Mere, Quebec, permitted itself to be told by one of its staff that it was in a fair way to destroy its supply of raw material. Reforesting was undertaken in 1907, under the direction of Mr. Ellwood Wilson, and the results of that policy are explained in the current number of The Canadian Forestry Journal. Five thousand white, Scotch and jack pines were planted in May, 1908, on the waste lands of the St. Maurice Valley. These have reached an average height of five feet, eight feet and twelve feet respectively. Additional plantings were made every spring, and now a tree nursery has been established with capacity for a million trees per annum. It is the hope of the Company to plant one tree for every one cut down and ground into pulp. This will make the timber limits near the mills perpetual, keep the cost of transportation low and avoid the difficulty of having an expensive plant stranded in a bald country-side.

A Hint to School Teachers!

How a study of wood-using industries may be linked up with the everyday programme of the public school was well exemplified recently in Fort William. The Secretary of the Canadian Forestry Association delivered a lecture to several hundreds of children and teachers at an afternoon meeting in the Auditorium.

On the following day, two of the teachers took the trouble to co-operate with the lecturer in a way that may be duplicated in almost any town having a saw mill or boat or furniture factory or other plant using wood and can be done, too, without a lecturer's help. The Fort William Times-Journal mentions the undertaking in this way:

"As a result of the address by Robson Black, on forest protection and forestry, G. H. Mathews received a visit yesterday at his woodworking factory from two of the teachers of the Fort William public school staff with their classes who were escorted around the works and given a lot of interesting information by Mr. Matthews regarding the products of the forests and the use to which different woods were put and the possibility of making use of the waste material round a mill. The Mathews plant may from this time forth be made into an auxiliary school room if other teachers follow

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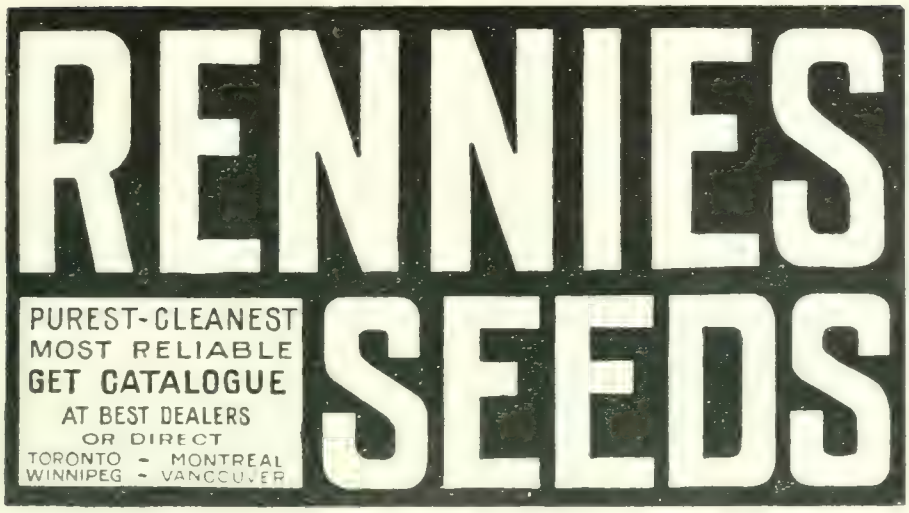

the example of their enterprising sisters."

School teachers everywhere are asked to send in their names to the Secretary, Booth Building, Ottawa, in order that they may receive regularly the 'Forestry Talks for Young People' and other material which can be used as supplementary reading for school classes.

Revive Timber Growing in England

London, Jan. 12.—(Correspondence of the Associated Press.)—A movement for the home growing of timber has been initiated here by Lord Selbourne in order to revive a steadily declining industry. Foreign competition has, within the past twenty years, driven all enterprise out of the British timber trade and frightened away capital. But Lord Selbourne hopes to take advantage of a temporary revival due to the war and put the industry on a permanent footing.

Forestry, he declared in an address before the English Forestry Association this week, has never received proper attention in England. English woods should be organized, new trees properly guarded and destructive animals, such as rabbits, exterminated. The speaker concluded with an appeal to coalmen to make their pit prop contracts with British landowners.

An immense amount of timber has been imported here since the outbreak of war, particularly for the construction of temporary barracks at the army training camps. Yet the freight rates have been so heavy that the resulting higher price of imported timber has given the British an unexpected opportunity. The freight cost has had the effect of a bonus for home products. Owing to the shortage of props from Norway, English props have been considerably used in the mines this year. English timber of the rougher sort for scantling and rough work has supplemented the usual Canadian supply as well.

The Forestry Association passed resolutions asking the government to retain at home experienced timber men offering themselves as Derby recruits, and also to recall them from the army.

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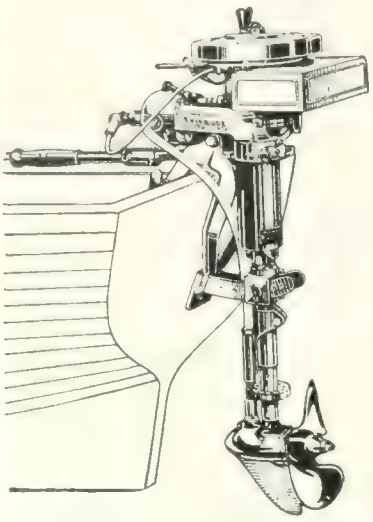

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Deciduous and Evergreen Forests

Those who lament the disappearance of the primeval forests of the older parts of Ontario probably have specially in mind the deciduous trees, which shed their leaves in autumn and renew them in spring. These were nearly everywhere interspersed more or less thickly with evergreens, such as the pines, spruces, balsams, and hemlocks, and in many localities the evergreens predominated. Pines and hemlocks were cut up into lumber in local sawmills, while the deciduous trees were got rid of by the aid of fire. The Canadian white pine, economically the most valuable lumber-producing tree in the world, has become practically extinct in the older settlements, and is becoming very scarce in the Laurentian region that was once its natural home.

The removal of the white pine, either by the lumberman or by fire, leaves room for an extensive and rapid growth of young deciduous trees that are of no great economic value; birches, poplars, basswoods, maples, and others. Unless these spaces are reseeded with white pine, there will be no new valuable crop of timber, and the denuded spaces will remain what they are now: the "waste lands" of the Crown domain.

In this connection arises the question of utilizing these same waste lands for ranching purposes. Assuming that the ranching of beef cattle would be a good use to put such lands to, then it is worth while to recall to mind that while cattle are fond of browsing on the leaves and twigs of the young deciduous trees, they have no inclination to

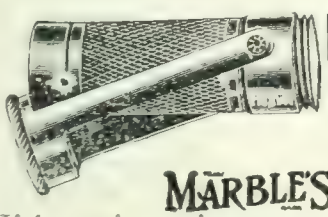
feed on those of the resinous ones. For this cause the presence of range cattle on such a ranch might prove beneficial by repressing the growth of useless young trees and promoting that of young trees likely to become economically valuable. It takes more than a generation to produce a white pine tree fit for sawing into lumber, but land may, long before such trees have become sufficiently mature for cutting, acquire added and increasing value to an indefinite extent through the mere presence of a growing crop of young pine trees. —(Toronto Globe.)

Forest Protection in Canada

According to press reports, Sweden proposes to cut off the export of chemical pulp to Great Britain. Naturally, all eyes are immediately turned to Canada to supply the threatened deficiency.

The Commission of Conservation has just issued a report on "Forest Protection in Canada, 1913-1914," which is of particular interest in this connection. It contains much information respecting the work of the provincial forest services and of the federal departments intrusted with the care of our forests.

Forest fire protection is assuming a large place in public attention. It is obvious that, if Canada is to continue as a wood-producing country, she must conserve her resources of this natural product. The report treats exhaustively of the fire protection of forest lands along railway



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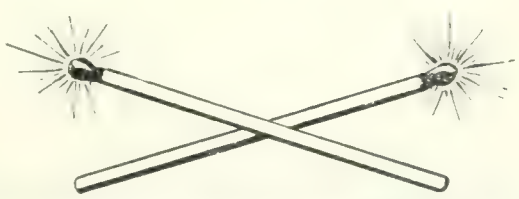

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rights-of-way. Through co-operative action, great headway has been made in securing the reduction of forest losses through fires traceable to railway causes.

The forests of British Columbia and on Dominion lands in the West have been dealt with in reports containing the results of special studies conducted by Dr. C. D. Howe and Mr. J. H. White. The Trent watershed in Ontario, has also received especial attention, in a report of an investigation by Dr. C. D. Howe in the townships of Burleigh and Methuen. This district is important in that, while of very little value as an agricultural area, it is being repeatedly overrun by forest fires and the little remaining merchantable timber destroyed. It is suggested that the area be placed under the control o fthe Dominion Forestry Branch for protection from fires and for reforestation.

Because of lack of field supervision, more money is wasted in fire protection to-day than is used economically. Fire wardens are nearly all temporary men, and if one does not give them supervision and training, and does not try to keep the good men from year to year, one cannot get the results desired. In the first fire protection services of Canada, far more wardens were wasting money than were making good use of it. Unless we have good permanent rangers year after year we will not get the good results because we have large areas to protect with very small sums of money.—H. R. McMillan.

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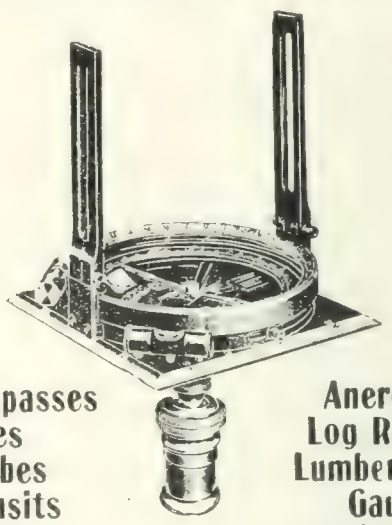

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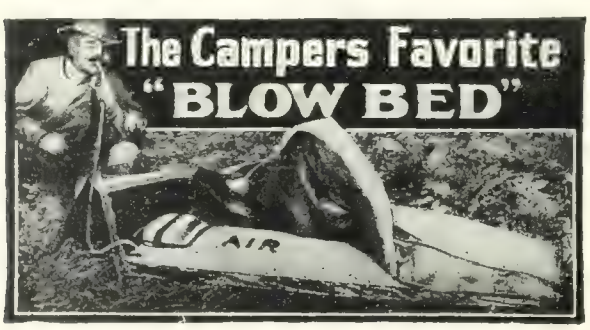

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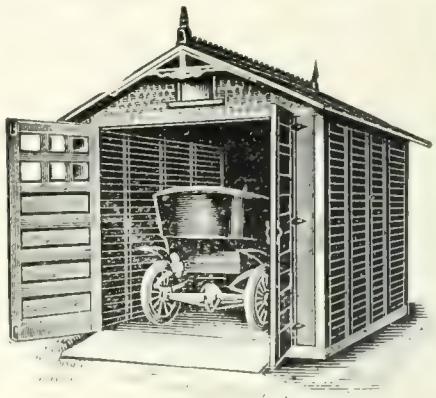

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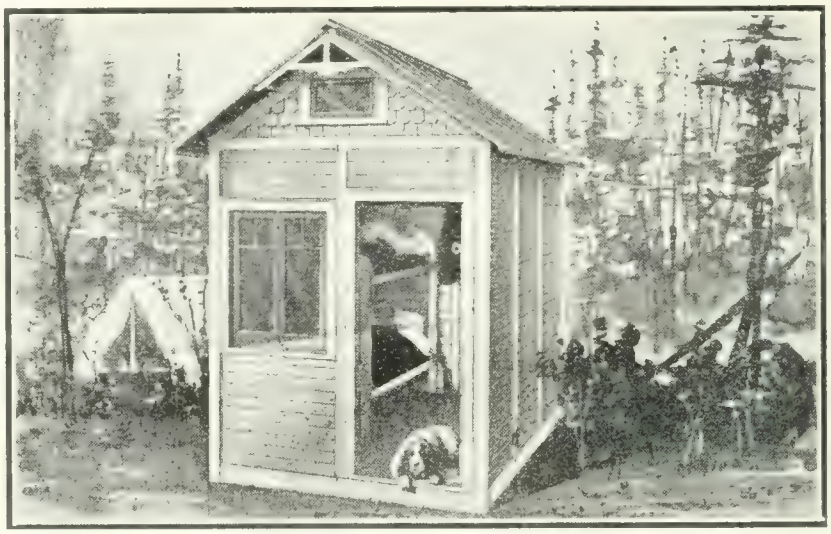

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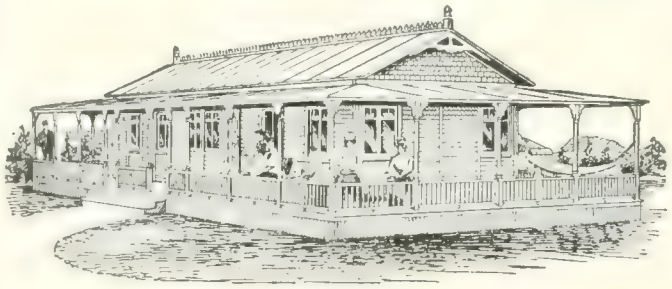

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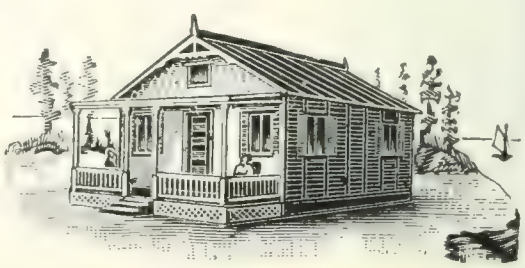

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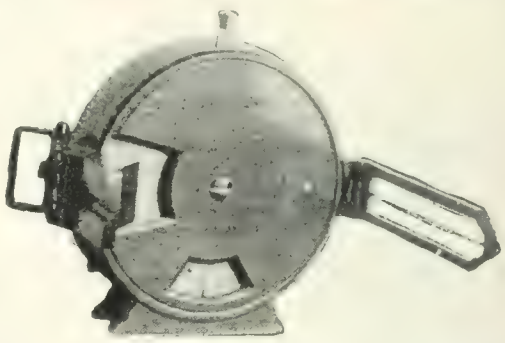

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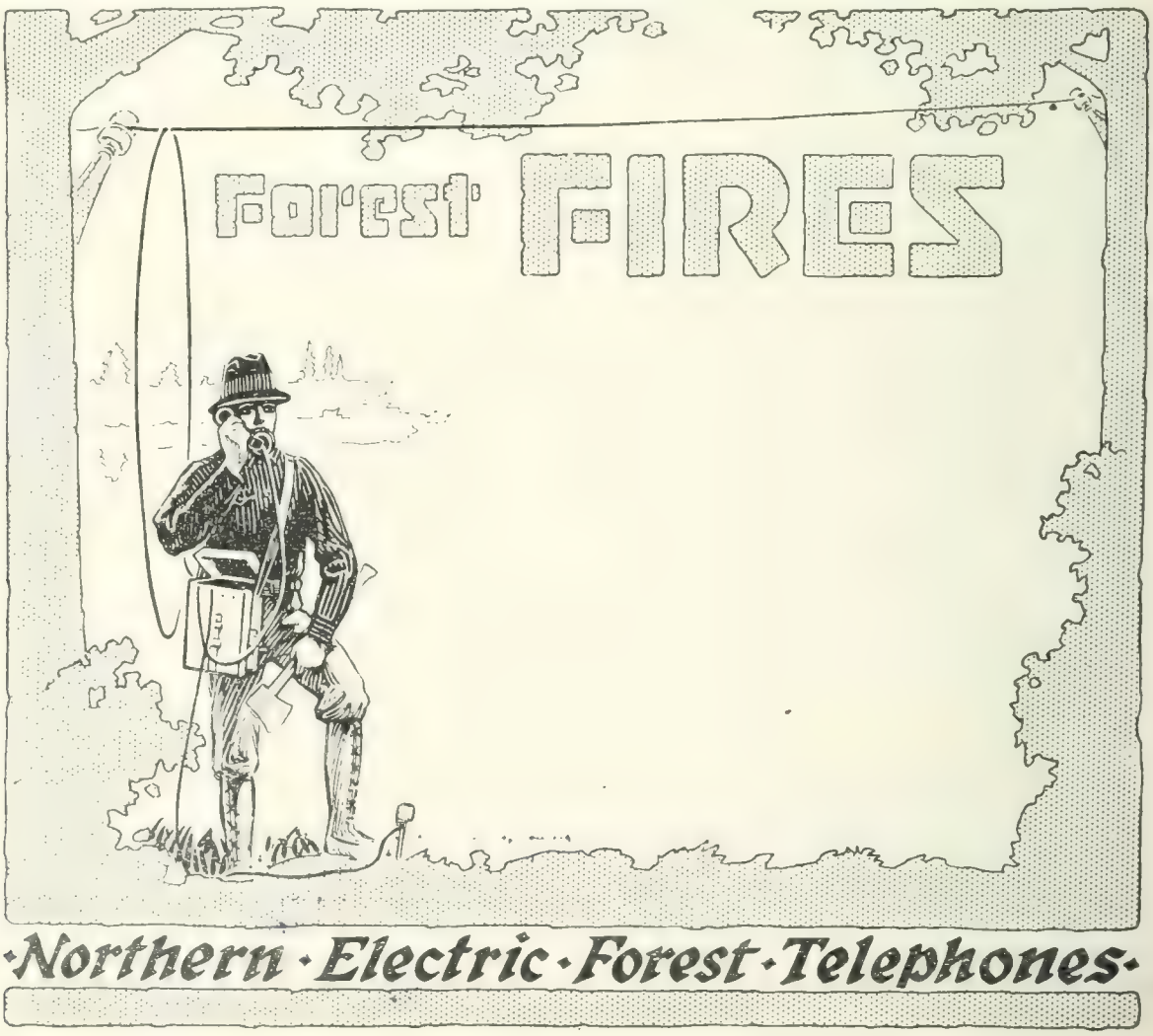

Canadian Forestry Journal

APRIL, 1916.

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Rebuilding Forests of France

A Graphic Article Telling of War's Havoc on Great Woodlands —A Century of Labor Needed.

(Translated for the Canadian Forestry Journal.)

> *"From the woods of Ailly, there remain but a few mutilated trunks. It is a field of desolation, levelled by shells. There no longer exists an inch of ground that has not been overturned by explosives."*

The January issue of "La Science et la Vie," a review published in Paris, contains a very interesting article on the damages wrought to the forests of France by the war and on the means and methods to be employed for their reconstruction. The author of the study is Mr. Louis Marin, député of Meurthe-et-Moselle, who is, as may be in inferred by the reading of his essays, an expert in matters concerning the preservation of forests and reforestation. We offer to our readers a résumé of the article, as sufficient space cannot be spared for its entire reproduction.

After having alluded to the way with which the Germans are pillaging those parts of the forests of France where their armies are operating, imitating in this work of destruction, their ancestors, the savage invaders of 1870, who unjustifiably and mercilessly laid waste the woodlands they had frequented, Mr. Marin goes on to describe how the forests have to be necessarily treated by both sides in this tremendous conflict. He says:

"What have been, during the war, the causes of our forests' destruction? The building of trenches on the two adverse fronts; the ravaging effects of projectiles hurled by guns of all calibers, which, in a hailstorm of iron, mow down everything before them, breaking the trees and leaving, instead of a thickly-wooded area, a mere strip of land covered with dismantled trunks and dead snags; the construction by the engineering corps of works of defense; the consumption of firewood; the erection of log shelters, in short, of many works necessitating an extensive felling of trees, and, finally, the hewing down of an enormous number of trees of all sizes which obstructed the range of the artillery."

Woods in Warfare.

Mr. Marin then recalls the explanations he has given, in June, 1913, of a bill submitted to the French Parliament concerning the protection of the forests. He had then dealt with the importance of the wooded regions in warfare. When a forest stands in the

way of the invaders, what obstacles does it not constitute? Especially in the neighborhood of fortified places, wooded tracts serve as an obstruction to the advance of the foe. The latter finds it impossible to penetrate them with its convoys; he cannot build through them the railroads necessary and he is therefore unable to transport any farther his huge guns. Besides, the home forces can conceal themselves in those woods; posted in ambush among the trees and under the branches, they cannot be detected even by aerial reconnoitring, and they thus place themselves in a splendid strategical position." The writer draws the attention of his readers to the fact that this present war has amply demonstrated the usefulness of the forests in wartime:

"Everywhere, these (the forests) have been of a precious assistance to our soldiers; it is while concealed in them that we have lost the least men. From the offensive point of view, in this war of trenches which has been waged for long months, it is where our positions were protected by woods that we have gained more ground. From the defensive point of view, they have fully favored our troops. The woods of Argonne, however reduced from Dehouriez, have set up in the way of the same invaders the barriers of 1792, and thus the investment of Verdun was averted. The woods of Grand-Courronné have contributed to the halting of the sad retreat of Morhange and to the resistance in the defence of Nancy. These services are recorded in the orders of the days; the country thus learns the names of the woods of La Grenrie, Bolante, La Chéminée-Saint-Hubert, Le Prêtre, of the forests of Apremont Grand-Couronné, etc.; our brave boys describe them in their letters."

In Times of Peace.

Mr. Marin now refers to the advantages derived from the existence of the forests in times of peace, from the utility and aesthetical points of view. It is needless to mention the value of the forest as a supplier of the timber used for industrial purposes; it is recognized as the foremost asset of a nation. Having reminded his readers of the great number of masterpieces in arts inspired by the forest, he deprecates the fact that the people do not seem to appreciate all the beauty of our wooded domain and the benefits derived therefrom:

"The citizens seek in them a day's or an afternoon's rest, but they do not care cutting the barks, destroying young shrubs, pulling out frail branches, for no purpose whatsoever but simply yielding, as it were, to an instinct of destruction which we would not even forgive in a child. The country-folks themselves, however laboriously and assiduously bent on their toil, do not as sufficiently as they ought respect all the trees, and in several of our provinces, chiefly in Normandy, entire regions have simply been ruined as by mere vandalism." The writer states that in many villages and towns, there are scarcely any trees on public places; vast parks are to be found where there are no shady trees. The value of the forest cannot be overestimated, and in compliance with principles well-nigh eternal, we are bound to protect it.

"The salubrious influence of the forest is as vivifying as that of the sea; it has over the latter the advantage of what I might call 'the uniform effect upon the mind' from which the nervous and irritable people derive most healthy benefits. For whoever wishes to and can avail himself or herself of its influence, the forest is a free physician and a dispenser of balmy essences powerfully invigorating. It is there that can be sought and nearly always found the vital and mental equilibrium lacking in many people otherwise healthy, not afflicted with neither serious ailments nor apparent injuries, but who are overworked and exhausted by the conditions of modern living." The writer here names a

French first line trenches plowed by German shells. The forest in this section was battered to fragments.

few of the trees possessing the most soothing properties, such as those of the magnificent coniferous family: the maritime pine, the pine of Italy, the common fir, which are found in all the forests of Europe.

Blocking Floods.

After having explained how the presence of forests purifies the atmosphere, Mr. Marin tells his readers how they prevent or reduce the possibility of inundations. Because of its spongy sod composed mainly of leaves, the forest absorbs the rain-water and like "a vast sponge, retains the water to let it afterwards slowly escape." Moreover, where they exist in places formed by mountains and sand banks, they constitute a protection for these. As such, they must be carefully preserved, inasmuch as they guard the people settled in those localities from landslides and sand drifting. The forests' beneficial influence on the climatic conditions of a country is also described. They act as a 'mediator' between cold and warm temperatures; where they exist, the summer is not so hot and the winter much milder than in places where there are none. Experience further shows that they regulate rain-falls and provides by means of their streams and brooks drinkable water to the neighboring inhabited places. Besides, the contamination of this water is impossible when supplied by the forests. Mr. Marin emphasizes as follows the important part which the forests play in delaying freshets, thereby preventing floods.

"This influence of the forest on the overflow of streams has been so carefully studied and appreciated, that reforestation is now considered, in mountainous regions, as the most effective means to suppress the floods. It is also acknowledged that the maintenance and the reconstitution of the forests prevent the sand and clay from sliding into the streams and rivers. In foreign countries, most rigorous regulations have been enforced with a view to adequately protect the forests.'

Lessons of the War.

The writer then deals with efforts made by France in the 19th century in the reconstruction of its forests. There still remain about four millions hectares (about 9,880,000 acres) of untilled lands which could be turned into well-wooded sections, and about two millions hectares of mountainous areas

which could also be transformed into forests. There are laws in France in connection with this national improvement, but they have been loosely applied. The war has now brought out the strict and urgent necessity of rebuilding the forests. "It is impossible to neglect our mutilated forests; it would be a crime to not take up now steps in order to ensure, in a comparatively near future, their reconstruction."

Mr. Marin then enumerates the wooded regions that have been subjected to the military operations of this conflict. He finds that, in general, the forests at the front have been laid waste; the soil as well as the forests themselves has been destroyed. At those places where the struggle has been most acute, the land will have to be completely razed. With regard to the trees injured by bullets, it has been found that their wounds, unlike those of man, do not heal. After a few years the trees die, and can then only be used as firewood. As they are liable to rot, it is better to fell them soon so as to obtain the best possible use of them. Here, Mr. George is quoted in his scientific explanations of the causes whereby an injured tree is sure to wither away.

A Few Mutilated Trunks.

With reference to the damages done to the soil, Mr. Marin quotes the following *communiquê* of April, 1915: "From the woods of Ailly, there remain but a few mutilated trunks. It is a field of desolation, levelled by shells. There no longer exists an inch of ground that has not been overturned by explosives."

The writer then discusses a bill he has prepared with a view to obviate the disaster caused by this war, and in which he suggests a thorough reconstruction of the ruined forests of his country. We give here a brief summary of the chief parts of the bill referred to; it deals with "the gravity of the damages caused to our woods and forests; the calculation and the estimates of these damages, the means and methods to be adopted in the reconstruction of the said forests; the necessity of special legislation in connection with these improvements; the difficulties of all kinds to be confronted in the application of the present law; the solution of the problem in the purchase by the State of all forests affected." He lays stress on a clause of the present law which to his mind should be amended, and which he would have substituted by a more acceptable proposition. According to the existing legislation, all sums paid to a proprietor, in the purchase of damaged and unused land by the State, must be employed by the proprietor in the improvement or reforestation of the said property. If, after the said improvements, he has money left, he must spend it in rebuilding adjacent properties. Instead of this, Mr. Marin suggests that, after the proprietor has spent sufficient to completely rebuild his destroyed property, he be permitted to keep the balance; in all cases, the State would pay for the said lands amounts corresponding with their full value, prior to the war. This measure would have the advantages of indemnifying the settler for his loss and of turning over to the State valuable tracts of wooded lands which would constitute a splendid addition to the national resources and which it would be bound to protect. — In explaining his bill, he admits that it will be difficult to ascertain the whole extent of the damages; a committee of experts would be entrusted with this task. Mr. de la Roussière, general secretary to the Forest Committee, is here quoted: "About 515,000 hectares of our forests are damaged. It is not completely devastated, but in estimating the loss at two-thirds, we should not be far from the truth. It will take at least a century before our forests are restored to their original conditions."

What of the Future?

The task will be enormous, but it will have to be attempted. The country will ever need wood for fuel and

timber for industrial purposes. In 1912, timber was scarce in France; lumber for the amount of 192 millions of *francs* has been imported in that year.

"The scarcity of timber for constructional purposes is not limited to France; it constitutes a real universal crisis. The forest reserves on the face of the earth are being rapidly exhausted, especially the timber from the caducous species. The manufacture of wood pulp has consumed entire forests in America,, as well as in Europe."

Mr. Marin then considers the best methods to resort to in estimating the damages done to the forests and in their reforestation. "The proprietor will have to remove the fallen trunks, the injured trees, etc.; the soil will then be levelled, and local rangers' houses determined. This being done, he will proceed with the primordial work, i.e., the re-sowing of young trees in order to reconstitute the forest, without neglecting the natural disposition of trees, according to the number of years required by each species for their full growth, and the purpose for which they are intended. Timber from twenty to twenty-five years old can be used for fuel; from fifty to sixty years, for use in the interior of mines; from eighty to one hundred years, for the production of lumber, and about 150 years old for industrial purposes. In the latter-named, there are the oak, the ash, the beech and like species. This work accomplished by the proprietor will be but the preliminaries of the task entrusted to Time, and which years alone can perform. It is the work of several centuries."

Estimating Damages.

Referring once more to the damages to which this war has subjected the forests of France, the writer does not lose sight of the fact that the devastation is still going on as violently as ever, and that it is impossible to foresee all the efforts which will be required of the nation. But France must be interested now in this great problem in order to be ready to proceed, when the time comes, with as least delay as possible to the reconstruction of her forestrial resources. "All delay in the rebuilding of this heritage," he says, "would spell losses impossible to estimate to thousands of people living on the forests."

"In conclusion, I could not do better than to quote the following paragraph from one of Bernard Palissy's most interesting works:

"When I consider the value of the least branch and shrub, I am astonished at the great ignorance of men of to-day who seem to train themselves to pillaging, hewing and mutilating the magnificent forests which their predecessors have so carefully preserved. I would not mind their devastating them if they would afterwards rebuild them, but they do not worry in any way of the time to come and of the great loss they will have caused to the coming generations."

"These words were written in 1580," adds Mr. Marin; "they are worth consideration, because they have never ceased to be of the deepest actuality."

PUBLIC LECTURES.

Public illustrated lectures have been given by the Secretary during the past few weeks at McGill University, Montreal; Grand Mere, P. Q.; Cardinal; Sault Ste. Marie; Hamilton; with further dates arranged for Marmora, Ont.; Montreal, Ottawa, Toronto. The plan has been followed of giving a lecture at High Schools or Technical Schools in the afternoon preceding the evening lecture.

Burning Off the Claybelt

Peculiar Problems of Agricultural Areas of Northern Ontario Investigated by the Association.

Forest conservation in Northern Ontario offers more than the normal complications. Several weeks ago the Canadian Forestry Association submitted to some of the Boards of Trade along the Temiskaming and Northern Ontario Railway a form of resolution the main points of which they were asked to endorse. The resolution called upon the Ontario Government to find some means to curb the number and destructiveness of settlers' fires in the forested districts of Ontario and suggested an investigation of the "permit system" in use in British Columbia and Quebec. Secondly it was asked that "the forest protection service should be so reorganized as to bring about adequate field supervision and inspection which would ensure efficient work by the rangers."

At a meeting of the Associated Boards of Trade, held at Haileybury, March 8th, the Secretary of the Forestry Association was given a courteous hearing and laid before the large number of delegates the main contentions. He stated that in advocating reasonable safeguards against indiscriminate burning, no one wished to hamper the settler in the necessary work of clearing the land, or in the liberal use of fire for that purpose. All that was asked was the supervision of clearing fires by a simple and convenient plan of permits from rangers, these officers assisting the settler to accomplish his results with the minimum of danger to standing growth and to neighbors' property.

An objection was taken by two or three members present to any government supervision of clearing fires whatever. These delegates advocated unrestricted employment of fires, big and small, to clear the lands of the Claybelt free them from excessive moisture, the perils of frosts and lengthen the growing season.

Others, however, strongly opposed such a view and believed that clearing could be done with some regard for the future. Non-agricultural lands, bordering the Claybelt and within it should be protected from fire.

A live discussion followed, in which many phases of the question were given expression. Finally a committee was appointed to investigate the question more fully and this committee will report back to the Associated Boards of Trade.

A Special Situation.

Peculiar local conditions in some at least of the agricultural communities of Northern Ontario undoubtedly call for special treatment as concerns forest protection. At the present time the settler away from the lines of the T. and N. O. railway appears to have a free hand in the use of tree growth. Many conflicting statements are heard in regard to the profit and lack of profit from settlers' pulp wood. Certainly a very large amount of pulpwood is cut by settlers and marketed, for over 110,000 cords from homesteads came down the T. and N. O. Railway last year. On the other hand, one will meet with plenty of settlers, capable looking men, who will give

fact and figure to demonstrate their inability to make day wages out of cutting and marketing the pulpwood on their properties. That the Ontario Government should undertake to ross and market the pulpwood for the settlers is a piece of advice frequently heard but experiments in that paternal direction have not been notably successful. Again, the suggestion is made that the railway rates should be lowered so as to deliver the pulpwood at the United States border leaving a better margin for the settler. This in turn is countered by the statement that reduced railway rate on the T. and N. O. would be absorbed by the pulpwood buyers and the settlers would be no better off. The marketing of wood from clearings is complicated by many factors, not the least of which is the newcomer's inexperience in such forms of work as bush clearing, the scarcity of proper equipment, the relative rarity of good roads. In spite of these handicaps, however, the settlers shipped out last year, as mentioned above, the large total of 110,000 cords, and near such communities as New Liskeard one does not lack for examples of prosperous contented farmers who have braved the inconveniences of pioneer life and have come out at the happy end.

Unrestricted Burning.

These fortunate examples do not alter the fact that an influential percentage of 'local sentiment' throughout the Claybelt favors unrestricted burning off of the forest growth, not only what is immediately required for crop purposes but far in advance of settlement for many years to come. To make a living in the shortest possible time and by the most direct is the natural ambition of newcomers the majority of whom have almost no capital whatever. Whether the heavy clay soil would be the gainer by the avoidance of repeated fires is a secondary consideration.

The Leading Question.

The vital question in Northern Ontario resolves itself into the conservation of forest growth on lands not suited for agriculture and this automatically rules out, under present conditions, the Claybelt section. It is quite true that even in that enormous territory, some form of supervision of clearing fires would work in the interests of the settlers themselves and of every town and village, but until the absolute forest land of Northern Ontario, south of the Claybelt, and measuring roughly a thousand miles long and from one hundred to two hundred miles wide receives proper fire protection, the Claybelt itself can not be singled out for special treatment. Within this non-agricultural region are some Reserves and Parks, but the condition of much of the remainder shows how very urgently protection is required. From the appearance of much of the country south of Cobalt and for some distance back from the railway, with little or no settlement in sight, the combination of cutting and fire have left no very inviting prospect for the future. Ontario has over 2,000 wood-using industries and upon the supply of enormous quantities of materials from Northern Ontario their security depends.

All Favor Reforms.

As to the Association's suggestions for the better control of fires on non-agricultural lands, the Secretary found practically a unanimous opinion among settlers, merchants, miners and professional men of Northern Ontario. These men fully appreciated the value of standing forests as a source of supply for Ontario's industries and knew likewise the inadequacy of the present protective system. That forest rangers should be closely supervised was not disputed in any quarter.

The Editor of the Cochrane "Claybelt," an influential newspaper in

that district, made the following observations following the discussion by the Cochrane Board of Trade of the Canadian Forestry Association's proposals:

From Any Angle.

"Take it from any angle you will, forest fires are a tremendous waste and waste in any shape or form is always sinful. There is no intention to prevent the settler from clearing and burning every stick of timber on his homestead, if he feels thus inclined, but when that settler sets fire to his slash carelessly and consequently destroys and lays waste the country for miles and miles around him, wasting in our days what it took nature half a century to produce, destroying his neighbors' property and endangering their lives, that man is culpable and should be dealt with accordingly. What would become of our rivers, streams and lakes were we to denude the land here of all its timber growth.

That the burning of settlers' slash can be done judiciously we have ample proof in our neighboring province, where strict laws of forest protection are enforced and the clearing there is going ahead at a perhaps greater ratio than in our own province."

Paper Shirts for Soldiers

It is said the paper shirts made in Japan are now being served out to Russian soldiers for use in the cold and wet weather. A number of these paper shirts were used by the Russians last winter and they proved to be much warmer and cheaper than ordinary shirts. The paper is made from the bark of the paper mulberry tree. Shirts of this kind have been used by the Japanese army and people for many years, their only drawback being that they cannot be washed.

One Year's Pencils

The world's production of lead pencils probably amounts to nearly two million a year, half of which are made from American grown cedar. Owing to the growing scarcity of red cedar and to the fact that many other trees now little used appear to be more or less valuable substitutes for that wood in pencil making, the U. S. Forest Service has carried out a series of tests which show that next to the two species heretofore used for the purpose the best trees are in order of merit, Rocky Mountain Red cedar, Redwood, Port Orford cedar, and Alligator juniper.

Merchantable Timber

(From Mr. G. C. Piche's report in Quebec Statistical Year Book.):

Provinces.	Millions of acres
Nova Scotia	5
New Brunswick	9
Quebec	130
Ontario	70
British Columbia	100
Manitoba	..
Saskatchewan	100
Alberta	..
Total	414

Bushmen's Battalion

A report states that permission has been granted to lumbermen now attached to overseas battalions of the 2nd Divisional Area to be transferred to the 224th Foresters' Battalion of Ottawa.

The Battalion will mobilize at Quebec early in April and will be ready for the transports within five weeks from the time the war office asked for it. The officers in command are Lt.-Col. Alex. McDougall, Major Gerald White, M.P., and Major B. R. Hepburn, M.P.

Canadian Forestry Journal, April, 1916.

Success of Aeroplane Patrols

Wisconsin's Experiment Proves Practical Use of Flying Scouts — Aviator Vilas Surveyed Sixty Miles at a Glance.

(Additional interest is given the following article by the knowledge that several Canadian forest protection officials have suggested the use of aeroplanes for patrol purposes. One would be unwise to deny the adaptability of flying machines to protective work in view of the good results obtained in Wisconsin.)

By F. B. Moody, of Wisconsin, U.S.A.

During the fire season of 1915 Wisconsin was fortunate in having the services of Mr. L. A. Vilas, who was operating a hydro-aeroplane in the vicinity of Trout Lake, where the central station of the Forestry Field Organization is located. Mr. Vilas volunteered his services, and was made a deputy forest ranger by the State Forester without remuneration.

The forest reserve region, although of high altitude, is a great plain containing many lakes and swamps, though no abrupt hills, and from the aeroplane some 200,000 acres of land can be surveyed. A fire 30 or 40 miles away can be easily detected.

The pilot should go over the country he is to patrol either on foot or horseback, thoroughly familiarizing himself with all lakes, rivers, railroads, strips of timber and cleared lands, and make it a point to find as many land marks as possible, at least one for each point of the compass such as a lone settler's farm, a brightly painted house, a railroad (the direction in which it runs, as the smoke of a moving train is oftentimes useful in keeping one located), a small town or range of hills. All the above objects mentioned are very noticeable 10 or 25 miles away at an altitude of 800 to 2,000 feet.

Seeing for Sixty Miles.

At an elevation of 1,500 feet on a clear day a fire 60 miles away in any direction is visible to the naked eye. It isn't a case of finding a fire, but to locate it correctly is the job. Smoke will show up very plainly from the air. Mr. Vilas reports that during a flight across Lake Michigan from St. Joe, Mich., to Chicago, he was completely out of sight of land, or anything else for that matter, for over three-quarters of an hour, and at an altitude of 4,600 feet. The first thing he saw was the smoke from the South Chicago Rolling Mills. This was in sight over ten minutes before any shore line was visible at all.

People often ask what a country looks like from the air. It's difficult to describe it, except that it looks like a large painted map on a small scale, without section lines.

The efficiency of an aeroplane in spotting forest fires is without doubt as practicable as any use to which it could be put. I myself was very much surprised with what ease a fire could be spotted and located, and there is no question in my mind but what the aeroplane will practically do away with some observation towers. The use of the aeroplane in the European war in the way of spotting and locating gun fire, armies of men, supply trains, etc., is well known, all of which objects show up comparatively small in comparison with forest fires.

Three Counties a Day.

It would be an easy task for a pilot with a good land machine to patrol three or four counties in a state each day, at the same time carrying mail, supplies or passengers to any outlying ranger's cabin. A useful load of 1,000 pounds is nothing for the average machine, and as far as weather conditions are concerned, a pilot with a well-powered plane will fly in anything short of a gale.

The limitations are the lack of sufficient landing places in a thickly forested region, and highlands. For this reason a few lots of six or seven acres each should be cleared at different places, depending upon the necessity of landing places, where aeroplanes are used.

The machine used by Mr. Vilas is standard, four-passenger Curtiss Flying Boat, 110 H. P. Curtiss Motor; speed on water 45 miles per hour; speed in air 60 miles per hour averages; width of plane 38 feet; length of hull 26 feet over all; weight of machine, without passengers or fuel, 1,400 pounds; climbing capacity 1,000 feet in six minutes, and consumption of gasoline about eight gallons per hour.

Brave French Foresters

In the Revue des Eaux et Forets is given a list of the loss to the French Forest Service after a year of war. This comprises 46 men, including one inspector, 7 assistant inspectors, 27 forest assistants and students, 5 students who were just admitted to the forest school at Nancy, and 6 officers who have disappeared (possibly captured), but concerning whom no official information has been received. Judging from the account of the work done by foresters each month, the French Forest Service is making an enviable record, since quite a number of them have been not only cited in the orders of their brigade, but for exceptional bravery in the army orders of the day.

HAVE YOU PAID YOUR 1916 FEES?

Members are respectfully reminded that the 1916 Membership Fees of the Canadian Forestry Association should be paid, if possible, this month.

The Association's extensive publicity work depends entirely upon voluntary contributions and members' fees form a very large part of the annual revenue.

Make all cheques payable at par to the Treasurer at Ottawa.

Prisoners Set to Work

The French Minister of War has facilitated the employment of prisoners for lumber operations in France, with the provision that not less than 50 men would be employed in one place. The emploeyr guarantees food and lodging and pays the sum of 8 cents per prisoner per day; 4 cents going to the prisoner and 4 cents for his clothing. If the employer only furnishes lodging and beds without food, he must pay, in addition, 20 cents per day. If neither food nor lodging is supplied, the total cost to the employer of each prisoner is 30 cents per day, (1 fr. 57). In case of laziness, it is provided that the 4 cents will be withheld from the prisoner.

A Novel Fire Poster

Dauphin Herald: "Supervisor Chas. Wellman, of the Duck Mountain, is always practical. His latest stunt is to utilize some of the bulletin boards that were in commission during the late temperance campaign to educate the public as to importance of preventing fire getting started in the timber belts.

Torrent Control in France

When the French Programme is Completed, Total Cost Will Not Exceed One Year's Damage by Unruly Streams.

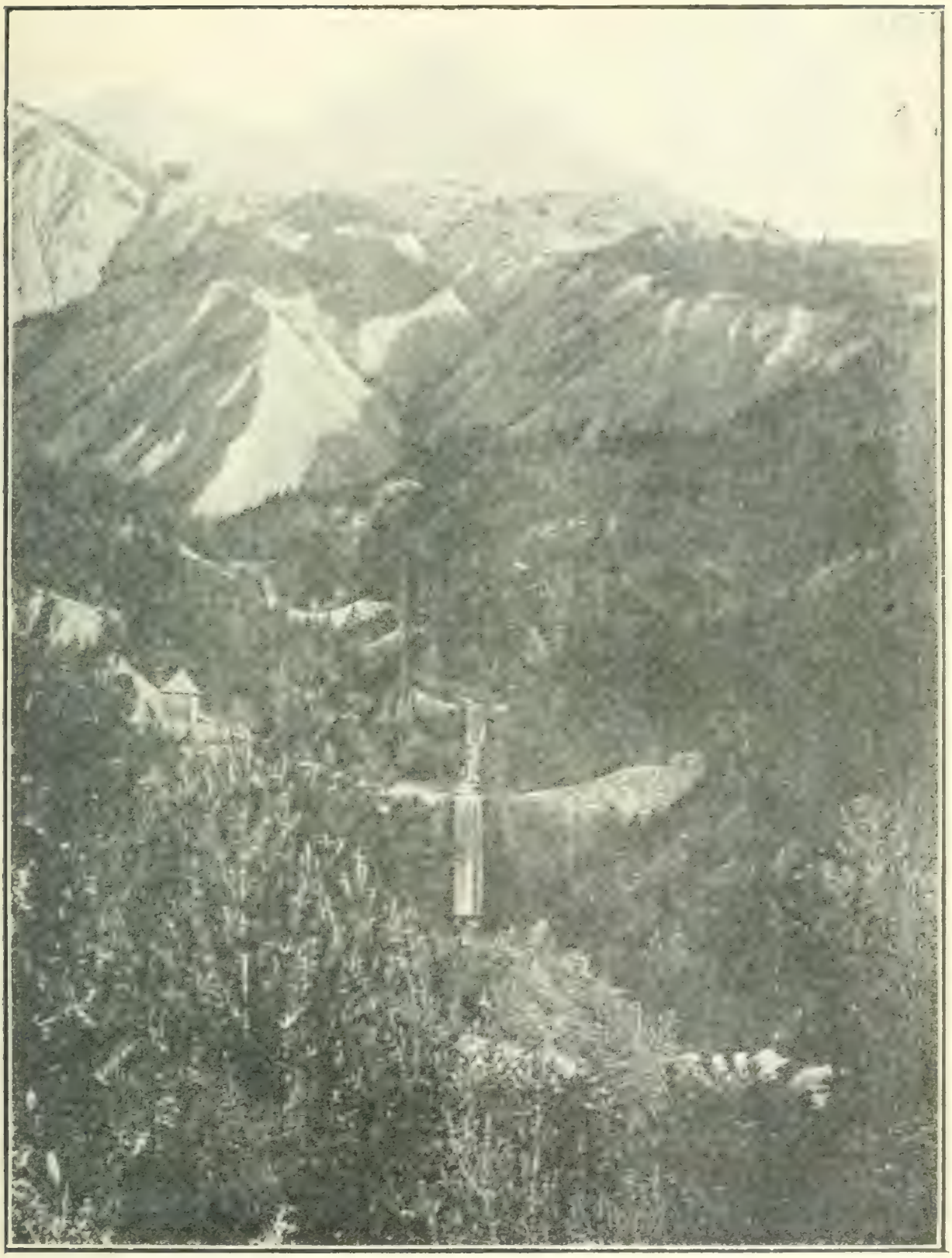
By H. R. MacMillan,

Timber Trade Commissioner for the Canadian Government; Director, Canadian Forestry Association.

The damage due to floods and torrents from denuded water-sheds is probably the least serious of the effects of forest destruction in Canada. Nevertheless very large sums are being expended annually by railways in protecting road bed and bridges and by municipal, provincial, and Dominion authorities in protecting roads and public works against damage by torrents. The total amount so expended in Canada each year, while unknown,,, must be very great indeed. Canadians may therefore be assumed to be interested in the manner in which the control of torrents has been accomplished in France. It will be observed that whereas the expenditure in Canada is usually at the bottom of the stream in protective works,, which will be a source of expense, the expenditure in France is chiefly at the seat of the difficulty, in reforesting the catchment area of the torrent, a work which will require outlay for a few years only, and which in some cases may actually become a source of revenue. Certainly the French system is more far-sighted than the Canadian.

Since the sixteenth century the problem of control of torrents has been periodically before the French public. Investigation of torrential action in 1797 gave rise to local laws for flood control . Very little action was taken, however, and discussion proceeded spasmodically until the tremendous floods of 1856 in the valleys of the Seine, Rhine, Rhone, Loire and Garonne, involved the whole of France in a loss reaching hundreds of lives and $40,000,000 in property. Always as elsewhere both with forest fires and floods, discussion of flood prevention in France had been most active after disasters which touched both the public imagination and the individual family or pocket. Sufficient had already been learned concerning the causes of the mountain floods, both from the investigaions of engineers and the work already carried out by the Government to point out the proper method of regulating destructive torrents and, accordingly, in 1860 a law was passed providing for the reforestation of the catchment areas of destructive torrents, the work to be carried out by the Forest Department. The defects of this law were that the money provided was not sufficient for undertaking the work on the scale designed, the reforestation of the mountain catchment areas decreased the grazing areas, upon which depended the mountain population, and the right assumed by the state to expropriate communal lands for reforestation purposes upon terms which threw the expense of the work largely on the mountain communities. Protest, culminating in armed resistance, led to the amendment of the law, substituting sodding for reforestation in areas where grazing was of paramount importance. Sodding did not prove

The two engravings from which reproductions have been made on this and the adjoining pages were received from Mr. H. R. MacMillan, Special Trade Commissioner of the Dominion Government, and Chief Forester of British Columbia. At the time of writing, February 16, 1916, Mr. MacMillan was at Lahore, India. The pictures graphically illustrate the success of torrent control in France. The first shows a torrent in the Lower Alps, the bed of which has been built up by barrages behind which sediment collects. Picture taken in 1887.



A picture of the same torrent twenty years after. The barrages by preventing the cutting down of the bed of the river have also prevented the erosion of the banks which are now covered with forest.

a satisfactory means of stream control, and the other defects remained. Finally in 1882, after 18 years of agitation, the work of torrent control was placed upon a new basis by the law at present in force.

All Interests Considered.

The Forest Service still remains responsible for the work of stream control. Works are undertaken only where soil erosion has begun. The projects of the Forest Service are examined by a government commission on which local interests are represented and the boundaries of the area within which remedial works were large, and the formation of revenue bearing forests was an integral part of the scheme. Now an effort is made to restrict to a minimum the area upon which works are conducted, and on this restricted area to undertake intensive work, not only plantations to fix the soil and check the run-off, but also engineering works to break the descent of the water and support the banks and beds of the torrent. Large areas of forest are being established only in the lower Cevennes.

The works conducted by the State are carried on only on land belonging in fee simple to the State. Should there be within the area necessary for the control of a stream land owned by bodies and persons other than the State, one of two courses is adopted.

Taking Private Lands.

The State may buy or expropriate the necessary land. The right of expropriation is rarely exercised. The State acquires by friendly agreement the land on all streams where the public interest in the control of the stream is paramount.

The owner of the land, whether a private individual or a community,, may retain the property upon condition that an agreement is made to conduct within a term of years fixed by the Forest Service under the supervision of the Forest Service the improvement works necessary. Communities usually avail themselves of this privilege, and in such cases both the State and the departments in which the community is situated make money grants equal together on the average to one-half or two-thirds of the cost of the work. The State also assists with advice, and in the case of reforestation with seed and plants.

The law also names certain mountain communities in which, because of their important effects on stream flow, pasture lands must be treated according to conservative regulations in order to prevent destruction of the sod cover by over-grazing. Any ordered management of mountain pastures has been strenuously opposed by the mountain population, even though the object of all such regulation of use is the improvement of the pasture. Money grants have been made by the State, and assistance has been given freely in all cases where private individuals or communities have shown a disposition to protect mountain pastures. Nevertheless, the opposition still persists. A commisison was appointed in 1910 to study better means of improving conditions and amendments to the law were under consideration at the outbreak of war.

Developing Specialists.

The French Forest Service in vigorously taking up the responsibility placed on it by the law of 1882 has led the world in works for torrent control. Foresters and engineers have co-operated in checking the destructive headlong plunge of waters from the Alps, Cevennes and Pyrenees. Half a century of experience, dating from the earlier laws, has led to the growth in the Forest Service of specialists in stream control, who have developed several well-defined methods of accomplishing their object.

The reforestation of the catchment areas of the torrential streams and their tributaries was in the early years the only means adapted for the control of water-flow. Even now, although in certain conditions it has been found necessary to rely on engineering works

reforestation remains the greatest weapon in the hands of the Forest Service. The catchment areas have been re-clothed extensively by planting and seeding, both with broad leaves and conifers. It has been found that except in the few situations where conditions are very favorable for forest growth, planting is much more satisfactory and even more economical when results are considered. Nurseries have been started near all the large projects, and coniferous species are used for an overwhelming proportion of the work, the most common of which are the pines, P. sylvestris, P. cembra, and P. uncinata. Other conifers planted extensively are larch (Larix europaea) in the Alps and Pyrenees and fir (Abies pectinata) in the Cevennes and Pyrenees. Broad leaf trees, chiefly various species of alder and willow, are planted in the beds of streams and on steep banks where it is important that a soil cover be rapidly established. Beech (Fagus sylvatica), chestnut (castanea vulgaris) are commonly used in the Cevennes and in the Pyrenees.

At the beginning of 1909, 629,488 acres had been reforested at a cost for establishing the forest cover of $8,000,000, or $12.70 per acre. Of the total, 363,151 acres have been reforested by the State, 134,005 by the communes, and 132,332 by private owners. The State has given valuable assistance to both the communes and the private owners, having paid 55 per cent. of the cost of the work accomplished by the communes and 37 per cent. of the cost of the reforestation carried on by private owners. The departments have also made small money grants for reforesting in the mountains amounting to 23.5 per cent. in the case of work done by communes and 5 per cent. in the case of plnatation by private individuals. The total cost of the reforestation work to the State up to 1909 has been $5,568,,683 on State projects; $812,807 subventions to communal projects; $348,744, subventions to private works; total, $6,730,234.

The remainder of the expense of establishing cover on the catchment areas of mountain torrents has been shared as follows: Private owners, $546,488; departments, $400,723; communes, $320,921.

Costs of Land Purchase.

The programme of work is by no means completed. The land already purchased by the State, 325,265 acres, represents only about 55 per cent. of the area for the acquisition of which plans have been completed. There still remain 266,047 acres, the purchase of which will be necessary. The average cost of the land purchased in France for stream control is $18.50 per acre. The expenditure in the purchase had reached in 1909 $6,022,644, and it was estimated that a further $3,500,000 would be required.

Over 92 per cent. of the land already purchased will be reforested. The remainder consists of rock outcrops and areas above timber line.

Reforestation alone is not always sufficient; where the catchment area of the stream is very small, where the immediate control of waterflow is an important consideration, where the slopes are very steep and the banks lack stability or where a very rapid fall of water must be broken, recourse must be had to the erection of barriers. The French Engineers in the Department of Waters and Forests are credited with leading the world in the construction of works for the artificial control of mountain streams. Over half a century of experience has developed several well-defined methods of correcting the flood tendencies of runaway streams.

The small tributaries, high in the mountains, which are dry during a portion of the year, but down which in the season of melting snow or rain the water sluices without obstruction, are first atacked. The most common method here is to cover the bed with a woven network of branches, held down by stakes or by poles criss-crossing the bed and driven into the banks. The bed of brush catches material

brought down by the water, prevents the carriage of gravel and rock to the stream below, and prevents erosion.

Bracing Up a Stream Bed.

At other times when branches are not available barriers of faggots, sods and stone are constructed at frequent intervals across the bed of the stream, the purpose of which is to hold up the water, catch sediment and prevent the cutting of the stream bed or banks. The barriers are rendered permanent by planting with shrubs or with cuttings of such species as willow and alder, which strengthen the banks, protect the bed of the stream, and form a living network of branches and roots to hold back flood waters and their burden of earth and rock.

Those portions of streams in which a large volume of water is flowing, where the bed and banks are rapidly cutting, and where torrential characteristics have already developed, require more serious treatment. In such cases masonry walls are built with the object of impounding the products of erosion, checking the headlong flow of water, preventing the cutting down of the bed of the stream, supporting unstable banks. The bed banks and flow of the stream are carefully studied before work is begun, and walls and barrages, as they are called, are designed to meet the requirements of each particular case, both so that the masonry itself may meet the stresses to which it will be subject, and further that the detritus accumulated by the masonry will prove an indirect support to shifting banks and a valuable means of decreasing the grade and checking the speed of the stream. According to the gravity of conditions, the barrages vary from simple dry stone sills set across the bed of the stream a few feet apart to mortar-set stone walls three feet or more thick, fifteen feet high, crossing the stream from bank to bank set so close together that the top of one wall is level with the base of the next barrage above it.

Sometimes it has proven easier to pave stream bottoms, canalize the waterflow, or create new stream beds than to correct the torrent by barrages; where necessary this is done. Occasionally also the constant sliding in of stream banks crushes the strongest barrages. Draining is then resorted to on a large scale in order that the banks may be fixed.

Preventing Snowslides.

The prevention of avalanches and snowslides is also undertaken. Snowslides usually follow definite courses. Stone walls five to six feet high, two and a half feet thick, are built across the upper courses of dangerous snowslides beginning at the point where the avalanche usually takes its start and continuing down the slope in ranks to the point below which snowslides are unlikely to start. When stone walls are impracticable, the desired results are secured by low banks of loose rock or earth disposed in the same manner. When conditions permit of it, plantations of trees or shrubs are made under shelter of the walls or banks.

There have been very few torrents upon which work has been done by the French National Government upon which some or all of the above corrective works constructed up to 1909 exceeded the cost of reforestation on the same streams, being over $6,560,000, including maintenance to the same date. The question of maintenance is a serious one. All the works require constant upkeep, and some have had to be rebuilt several times.

The opposition of the mountain population has been overcome in various ways, by employing them on the works by money grants for pasture improvement, and by subvention to creameries and co-operative dairy associations. The total amount of such expenditure is about $35,000 chargeable to the fund for the correction of torrents.

The work which the French have undertaken, re-clothing the drainage basins and remodelling the beds of

thousands of mountain streams, should, when finished, rank with the great constructive public works of the world. The task is now half completed. The cost up to 1909 was $20,650,000. The estimated cost for the remainder of the work in sight was then $12,000,000, exclusive of upkeep and exclusive of the expenditure necessary by departments, communes, and private individuals. *Such works however, should not be measured by cost, but by results. The obliteration of the torrents of France, impossible as it may have appeared in the beginning, will be practically accomplished with the completion of the programme .now .adopted. Torrential floods, which in one year wrought destruction equal to the total cost of stream improvement, will be no longer possible, and neither the vineyards and farms of the lower valleys, nor that important mountaineering element of the population which clings to upland slopes and valleys will hereafter be in danger by flood or snowslide. The price of one year's flood carefully expended will permanently add millions of acres to the productive area of France.*

The Use of Pine Oils in Treating Ores

Much interest has been exhibited in the application of what is called the "pine oil flotation process" to the treatment of ores in the Cobalt mining district. At present the scope of the process in Canada is confined to experimental work, although flotation has been in use at many of the big United States silver and copper mines for years past.

The apparent economy and simplicity of the process, which may give high value to the enormous quantity of tailings of the Cobalt and other mines at present regarded as waste, depends upon an assured supply of pine oil. This is now imported from the United States and no guarantee of more than a few months' supply can be had. Whether or not the Canadian mines can be made independent of imported oils for the flotation process is at present engaging the attention of experts identified with the Ontario and Federal Governments and experiments will be made at the Forest Product Laboratories, Montreal, along such lines. If Red Pine or other Canadian woods could be made to produce the quality and quantity of oils required, a new industry might be added to these now identified with the Canadian forest.

The system apparently is simplicity in itself yet there are things about it which cannot be explained even after exhaustive research work which is now being carried on. The principle is that air is forced under pressure through the canvas bottom of a tank-like cell, through which cell emulsified oil and water mixed with crushed ore held in suspension passes. The oil apparently forms a filament on the particles of mineral and brings them to the surface in the bubble. The froth is skimmed off and in it is contained the mineral.

The oils used may be broadly divided into "frothers" and "collectors." The pine oils are good frothers and coal tar and its various subdivisions are good collectors. It has been found that a mixture of coal tar, 50 to 60 per cent., coal tar creosote 30 to 40 per cent., and refined pine oil 5 to 10 per cent. give good results. Other pine oils work very well on Cobalt ores, however. The oil consumption per ton of ore approimates about one pound or from 2 to 3 cents per ton of ore.

Valuable Tests to Prove Forest's Effect on Streams

Experience has proved that the forest works efficaciously against many dangers resulting from the elements let loose, such as avalanches, falls of stones, erosion, earthslides, inundations. These are facts admitted and indisputable, but how and in what measure does the forest exercise this moderating action upon the destructive power of water? How can it lessen the destruction from inundations?

It is in order to attempt an answer to this leading question that the Swiss Federal Station of Forest Research in 1900 installed an observing station in the basin from which two streams of the Bernese Emmental are fed. These streams, tributaries of the Hornbach, are located in the territory of the commune of Sumiswald-Wasen, on the northwest slope of the Napf. The geological formation is fissured pudding-stone which decomposes readily. One of the basins, with an extent of 140 acres, is completely wooded. The other with an area of 175 acres has only a small average of wooded district, about 30%. The forest is composed of spruce and of alder bushes. The measurement of the precipitation, rain and snow, takes place regularly throughout the year. In each of the basins there have been installed three rain gauge stations at different altitudes. At the junction of the two streams with the Hornbach certain apparatus registers automatically every five minutes day and night the volume of the water flowing.

The Research Station is going to publish very soon the results thus obtained from these valuable observations. In the meantime if we refer to the provisional statements of the Research Station the two following points seem to have been definitely established:

1. In case of storms accompanied with heavy rains the maximum outflow in the wooded valley is from 30 to 50% less than that from the other valley, and there is another beneficial circumstance from the action of the forest, that this maximum flow is produced later in the wooded basin than in the other.

2. In the long periods of drought (the summers of 1904, 1906, 1908 and 1911) the wooded district gave without interruption a flow of water while in the denuded valley the stream dried up and all the springs ceased although at a normal time they have an abundant flow.

These observations seem thus to have demonstrated irrefutably the moderative action of the forest upon the regulation of the stream flow which some have denied.

Warning on Licenses

The Department of Colonization, Mines and Fisheries of the Quebec Government has favorably considered the suggestion of the Canadian Forestry Association that warnings against fire be printed on the fishing and hunting licenses in future. A letter to the Secretary from Mr. E. M. Dechene, Deputy Minister of Lands and Forests, states that such action has been decided on.

Experiments With Reindeer

The Story of Canada's Efforts to Introduce a Valuable Animal to New Forms of Service.

The connecton of reindeer and forest conservation is not so remote as first thoughts might indicate. As mentioned in a recent number of the Journal, Mr. Ellwood Wilson, Chief Forester of the Laurentide Company, Grand Mere, P.Q., has succeeded in domesticating a remnant of the herd brought to Canada through the efforts of Dr. Wilfrid Grenfell, and these have come through the past winter remarkably well and will probably show an increase. Last year the deer showed their practical value in browsing off the hardwood seedlings in plantations where the forester wanted evergreens only to grow. Many devices were tried in an effort to get rid of the hardwoods. The reindeer finally were turned in and devoured the hardwoods refusing to touch the conifers. That these animals were to be used for logging, or for winter travel in various woods operations and forest protection, is a happy theory which has not had much opportunity for demonstration.

The following article by Aubrey Fullerton in April "Rod and Gun" gives most interesting information on the reindeer question:

Five years ago a novel experiment was made by the Dominion Government in the way of wilderness colonization in the far Northwest. It was animal colonization, rather than human, but its success was likely to mean a great deal to the people who might settle there at some future time. For these new animal colonists were reindeer.

Forty reindeer were brought by the Government from Dr. Grenfell's herds in Newfoundland, and were taken across Canada to Fort Smith, up in the Mackenzie River country. There they were placed in a reserved area and left to make themselves at home in new surroundings. It was hoped that they would take kindly to the change, and for a time they seemed to do so; but something over a year ago it was reported that of the forty animals all but three had died or escaped. The Mackenzie country did not suit the Newfoundland deer, and the attempted colonization proved a comparative failure.

There are still many deer in the North, however, and though the native deer of those wilderness parts are far less tractable for domesticating than the reindeer of Labrador or Alaska, they have in a few cases, at least, submitted to the taming process—in proof of which is the accompanying picture of a deer team that a persevering halfbreed in the Athabasca country has trained to harness.

Success in Alaska.

The reindeer has been a pronounced success in Alaska, where there are now some fifty thousand descendants of the fifteen or twenty animals originally imported from Siberia. As a beast of burden the reindeer is far more satisfactory than dogs, and it finds its own living, feeding the year round on the moss and lichens of the Alaskan plains. Its powers of endurance are remarkable. Two hundred pounds, besides the sled, is a normal load for one animal on a long journey. A few winters ago a Government official travelled four months with reindeer teams, covering two thousand miles of barren country, in which the deer lived entirely on moss that they dug from under the snow.

At another time a relief expedition was sent to the Arctic coast, where some whalers were ice-bound, with three hundred reindeer, which were driven eight hundred miles with the temperature from twenty to fifty degrees below zero. The animals, which were intended for food for the imprisoned whalers, reached the end of the long journey in good condition, having foraged for their own food along the way.

The United States mails have also been carried along the Behring Sea coast, for several winters, by strong reindeer teams, and more satisfactorily than the Canadian mails in our own North-land have been carried by dog-teams.

Good for Meat Supply.

Another benefit that has followed the introduction of domesticated reindeer in Alaska has been the increase it has made in the meat-supply. Reindeer meat is not only the staple diet of the Alaskan natives but is already being shipped in small quantities to such markets as Seattle, and is finding its way to good American dinner tables. It is believed that, as the herds of reindeer increase, the mossy grazing grounds of Alaska will become a great meat-producing region for the Western States market.

The Canadian North has possibilities of exactly the same kind. It, too, can produce meat, and may some day be a valuable source of supply for our own market. The great sub-Arctic prairies are covered for hundreds of miles with rich grass, and in such abundant pasturage there is feeding for countless droves of cattle-kind. A suggestion has even been made that beef cattle should be taken into the North, as soon as the railroads make it possible, and turned out to feed upon the wide grass-covered plains of the Mackenzie and Athabasca territories; but at any rate those plains are the natural feeding-ground of meat-producers of almost equal value, the roving herds of deer and caribou. One of these days we shall perhaps be bringing down deer meat

from the North and making use of it to lower the cost of living in our towns and cities.

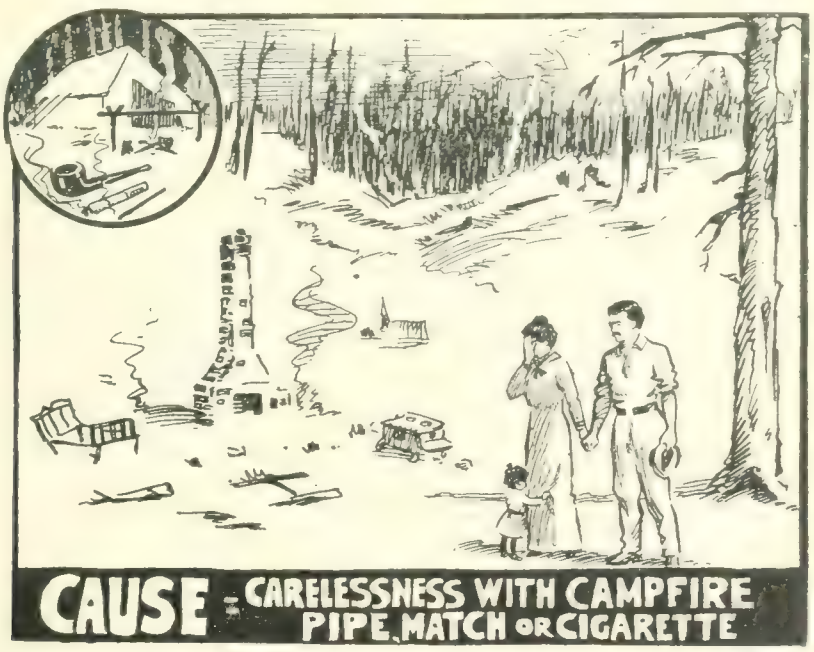
If the experiment in domesticating reindeer at Fort Smith had been successful it would have meant a great deal to northern Canada, and in time might have led to as beneficial results as in Alaska. Something may come of it yet, or another trial of the same kind may be made. But the native deer are there, at any rate, and it remains for Canadian genius to find some way of utilizing them. That Athabasca halfbreed has shown a very good example, as a beginning.

"A Matter of Opinion"

Under the above titl.e the Canadian Forestry Association will issue this month fifteen thousand small books of about thirty pages each, with colored cover, for general distribution throughout the Dominion. A French edition of eight or ten thousand will be issued simultaneously.

"A Matter of Opinion" presents to the reader the main arguments for forest protection in the form of soliloquies by The Settler, The Railroad Man, The Camper, The Fire Ranger, The Banker, The Power Engineer, The Taxpayer. Each speaks of the forest from his own point of view and testifies by his narrative to the forward movement in conservation during recent years.

These booklets will be sent to all members as soon as issued, and the bulk of the edition will be distributed direct to settlers, railroad men, etc., etc., through the Association's facilities provided by the banks, the railroads, forest departments, etc.



The above cartoon has been issued by the Association in the form of posters for the use of fire rangers, lumber camps, etc. The posters are on cardboard. 10 by 8½ inches, printed in green and red, and form a striking cartoon. Already several lumber companies and protective associations have made good use of them. They may be had on application to the Association office, Booth Building, at the price of $1 for fifty.

FROM THE ASSOCIATION'S FREE CARTOON SERVICE USED BY SEVERAL HUNDRED CANADIAN NEWSPAPERS.

The Canadian Soldier: "That's about the worst wreck of a forest I ever saw."

The Canadian Woodsman: "It is, eh? Then you ought to see what's left after a forest fire. I'll take you to a hundred townships right here in Canada that will make such a picture look tame. We think it is a pity for European forests to be smashed and yet we smash our own by nearly 10,000 timber fires per annum."

The Soldier: "H'm! That's a new way of looking at it."

Published in collaboration with the Canadian Society of Forest Engineers.

P. Z. Caverhill, Forester for the Province of New Brunswick, is preparing his plans for a forest survey of that Province, and has mapped out a most excellent scheme. He has been kind enough to ask the advice of many of the members and a very interesting symposium has been held and useful information collected and discussed. Mr. Caverhill will make a trip to Grand Mere in April.

R. R. Bradley, of the New Brunswick Railway Company, is preparing his final maps of the territory owned by that Company and expects in the spring to undertake planting operations on a large scale.

Henry Sorgius, Manager of the St. Maurice Forest Protective Association, made a trip to Michigan to attend the meeting of the Northern Forest Protective Association. Mr. Sorgius is very busy with his plans for the season's work, and is equipping a gasoline speeder and a Ford automobile with the new pump designed by Mr. Johnson, of the Railway Commission. Circulars are also being sent out to the settlers explaining to them the changes in the fire laws and asking their co-operation.

Ellwood Wilson went to Syracuse on April first to lecture to the students of the New York State College of Forestry.

A. C. Volkmar, Forester of the Riordon Paper Co., St. Jovite, Que., has been elected an associate member.

George Chahoon Jr., President of the Laurentide Co., Ltd., is spending the month of April, with F. A. Sabbaton, Vice-President of the Laurentide Power Co., at Hot Springs, Va. Mr. Chahoon is an enthusiastic golfer and Mr. Sabbaton is a tennis player of no mean order.

B. M. Winegar, of the C.P.R., reports that he will begin the planting of trees for snow sheds along the eastern lines of that road.

Arnold Hanssen, of the Laurentide Co., Ltd., has been busy all winter clearing off the flood basin of the River St. Maurice about to be flooded by the Company's new dam, hauling the wood and trying to dispose of it to the best advantage.

G. A. Gutches, Director of the New York State Ranger School, reports a very successful season.

Prof. R. B. Miller, of the University of New Brunswick, has been getting out some very creditable reconnaisance maps made by his students.

Mr. H. R. MacMillan is now in Calcutta, India, investigating conditions and markets and will proceed from there to China and Japan.

H. R. Christie, of B.C., is going to Ottawa, for the purpose of enlisting.

The activities of the Dominion Forestry Branch will continue along the same lines as last season.

A. H. Unwin, of England, is going to Nokling, via. Lagos Nigeria, Africa, for the next twelve months. Mr. Unwin is the only European member of the Canadian Society of Forest Engineers.

R. O. Sweezey writes from the Royal Military College at Kingston that he is carrying on a detailed survey for M. J. O'Brien in the Upper Ottawa, area 1,125 square miles, and that he gets away occasionally from his military duties to see how his parties are progressing. Recently he made a brief examination of the limits of the Mattagami Pulp & Paper Co., in Northern Ontario.

To a Pine Forest!

"A pine forest is one of the most beautiful features of nature. Of all quiet scenes it is surely the quietest. The harsh sounds of the busy human world, and even the dreamy murmurs of summer, are hushed there; no song of bird or hum of insect disturbs the solemn stillness; and only at rare intervals the mournful coo of a dove, making the solitude more profound, is heard in the deeper recesses. The weary, care worn spirit bathes in the serenity of the silence, and feels the charm and refreshment of its highest life. The trunks of the trees have caught the ripened red of many vanished summers, and are bearded with long streaming tufts of grey lichen, which impart to them a weird, savage appearance; but they are touched with grace by the wild flowers growing at their roots; childhood sporting in unconscious loveliness at the feet of old age. They form long drawn aisles and vistas, like the pillared halls of Karnak, or the Thousand Columns of Constantinople, which are indescribably attractive, for they appeal to that love of mystery which exists in every mind; they reveal only enough to stimulate the imagination, and lead it onward to lovelier scenes beyond. Life itself without these vistas of expectation would not be worth living.

Beautiful indeed is the pine forest in all seasons: in the freshness of spring, when the gnarled boughs are penetrated and mollified by the soft wind and the warm sun, and, thrilled with new life, burst out into fringes and tassels of the richest green, and cones of the tenderest purple; beautiful in the sultry summer, when among its cool, dim shadows the cheated hours all day sing vespers, while the open landscape is palpitating in the scorching heat; beautiful in the sadness of autumn, when its unfading verdure stands out in striking relief amid changing scenes, that have no sympathy with anything earthly save sorrow and decay, and directs the thoughts to the imperishableness of the heavenly Paradise; beautiful exceedingly in the depth of winter, when the tiers of branches are covered with pure, unsullied wreaths of snow, sculptured by the winds into curve of exquisite grace.

It is beautiful in calm, when the tree tops scarcely whisper to each other, and the twitter of the golden wren sounds loud inthe expectant hush; it is more than beautiful in storm, when the wild fingers of the wind play the most mournful music on its great harp-strings, and its full diapason is sublime as the road of the ocean on a rock bound shore.—(From "Teachings in Nature," by Rev. Hugh MacMillan.)

Fire Protection in Pine Logging

The Value of Any Protection is the Money Worth of the Loss it Averts.

By Coert DuBois,

District Forester, U. S. Forest Service, San Francisco, Cal.

When one walks about any large city he sees at frequent intervals expensive buildings and, through their open doorways, costly-looking apparatus or fine horses that look like ready money. From four to six big husky four-dollar-a-day men in blue shirts are tilted back in chairs in front of each one of these houses. On every other corner one notices a red painted iron box on a post that must be connected up with an electric wiring system, for which real money was paid. This all means that the risk of fires starting in a city and the value and inflammability of the structures subjected to this risk are so great that a system adequate to protect it is maintained, practically regardless of the cost of that system. I have seen many newspaper criticisms of the adequacy or efficiency of city fire departments, but I have never seen printed or heard a citizen utter a complaint of the high cost of the system.

In a well ordered factory you will see an $8,000 automatic sprinkler system, $2,500 worth of 4-inch water piping, and a $10 steel reel with $15 worth of fire hose on it at the end of the hall on each floor—an investment of $10,575. For what? To prevent $10,576 worth of damage. The value of any fire protection, then, may be stated as the money worth of the loss it averts. It can cost anything less than the loss which is reasonably sure to occur without it. Therefore, to arrive at a definite conclusion of what is a justifiable sum to spend on fire protection in any activity, it is necessary to inquire how likely fires are to start and the cash damage they may be expected to do, once started.

Problem of Fire Logging.

My talk will be confined to the fire question, because I don't know anything about any other kind of logging.

Contrary to popular opinion on the subject, the cause statistics collected by the Forest Service show lumbering activities to be the least prolific source of fires in the National Forests, only a trifle over 4 per cent. (literally 4.067 per cent.) of the total number occurring from this cause in the eight year period from 1908 to 1915. Nevertheless, because the total number is high—5507—the number caused by logging operations—224—is high when viewed independently.

I know of one outfit that had 16 fires on its works this summer. In any activity in the woods some measure of the number of fires which can reasonably be expected is gained from the extent of the legitimate use of fire which must necessarily accompany it. In the typical pine logging job there are perhaps 200 men in the woods, 80 per cent. of whom smoke cigarettes or a pipe while working; 6 steam logging

machines burning wood fuel; 2 steam locomotives burning oil, and a camp burning wood for cooking and heating. I should say the pine operator could expect to see start on his works an average of not less than five fires a year.

The elements of damage done by fires in the logging woods are, first and foremost, lost time; then, the cash loss by destruction or reduction in the value or efficiency of equipment such as donkeys, loaders, logging line, chutes, railroads, trestles, or camps; last, the value of the product is lowered when logs are damaged.

Sources of Loss.

Take the element of lost time. A fire is usually handled by the railroad section crew. It is not unusual for a five-man crew to work a day on an ordinary fire, leaving one man to watch it for 48 hours afterward. This means $21 in lost time. A larger fire may require a donkey, a camp crew, or the whole woods crew. It is not at all unusual for a part of all of the mill crew to turn out in an emergency. A fire which requires the whole logging crew of an ordinary double band mill will cost the operator, in lost time, about $400 per 10-hour shift. These figures refer to direct labor charges only and do not take into account lost operating time of expensive equipment or the supervisory and overhead charges which are going on while the plant is turning out no product.

If it is expensive to fight fires, why not let them burn? This would be good business if it were not for the fact that it would very probably be still more expensive in damage to equipment. A fire practically never ruins a donkey engine beyond repair, but $500 or $600 damage is a frequent occurrence. Burning the sled out from under a machine, for instance, would mean a loss of about $400, and it will yard no logs for several days. Logging cable is easily damaged, and the loss of the lines on one machine—say, 1,300 feet of yarding line and 3,000 feet of back line—costs $375. Repairing a line burned in two may be put down at $5 per splice.

Cost of Repairs.

The ordinary fire on a logging job does not destroy a chute—it about half destroys it. Repairs can be figured at $750 per mile of chute burned over. The most serious single equipment loss is the burning of a main line railroad trestle. It means that the main artery of the woods work is cut and the product of all work must stand still until the damage is repaired, at a cost of $3.50 per running foot of trestle burned.

I have seen, an hour and a half after a spark dropped out of the firebox of a moving donkey, an entire camp wiped out as thoroughly as though packed off by a cyclone. All that was left was a large black cloud of smoke, which cost about $2,200. Logs on the ground burn on the end, or, where they lie across others, pockets burn out of the sides. A fire seldom destroys them, but it reduces their value between 10 and 15 per cent.

Forest products rank second among the industries of Canada and are worth $180,000,000 a year. The important uses for wood in Canada are for lumber, lathes, shingles, poles, railway ties, pulp wood, hard wood distillation, cord word, hemlock bark for tanning, etc., etc. In the manufacture of lumber about 25 per cent. of the tree is left in the forest, in the form of stumps, tree tops, branches, leaves, etc., while at the saw mill about 35 per cent. more is discarded in the form of bark, sawdust, edgings, deal ends, shavings, etc. So that under the present conditions only 35 to 40 per cent. of the original tree is converted into finished lumber or other useful articles of products.

One corner of the Berthierville, P.Q., Forest Nursery.

Prussian Forests in War

War conditions have induced the Prussian forest administration to issue alleviating instructions to the managers of State properties. Moratoria for rents and wood purchases are permitted under circumstances. Brushwood may be given to the poor at one quarter its usual cost.

All the oak bark and spruce bark for tanning purposes is contracted to the War Leather Association (in which the government is partner) under easy conditions.

A serious deficiency exists in rosin, which has been mostly imported, and is especially used for manufacture of lubricants and of writing paper. There are three possibilities of securing rosin, namely by tapping spruce as used to be done long ago, by distilling any coniferous wood, by scraping the rosin exuded on spruce when damaged by game animals.

Curiously enough, the latter method is supposed to give at least most rapid results; while the second method is being experimented with. Instructions are issued how to scrape the rosin, which is to be 70 per cent. pure and is taken over by the "rosin accounting office" at about $2.50 per hundred weight f. o. b.

In experimental areas about 80 pounds per acre at a cost of $1 to $1.25 per 100 pounds could be secured.

In March, 1915, the administration pointed out that in order to assure sufficiency of bread grain and potatoes for human needs the number of pigs would have to be reduced. To prevent, however, later a meat famine, breeding stock and young stock should be carefully preserved, for which purpose the forest pasture should be opened up, herding the pigs wherever larger communities are involved, even to the extent of transporting the herds by train. The pasture is to be free of charge, to be continued till late fall or early winter.

From a photograph of a destructive forest fire in Northern Manitoba.

Silvicultural Problems of Forest Reserves

Learning the Character and Conditions of a Property in Detail—Administrative, Economic and Technical Problems.

By Dr. B. E. Fernow,

Dean of the Faculty of Forestry, University of Toronto.

(Following is the second part of Dr. Fernow's paper which commenced in the March issue of the Journal.)

In order then to inaugurate a systematic management of any property, the character and condition of the property needs to be known in detail; next, its administrative, its economic, and its technical problems must be recognized and solved.

These requirements in a forest property involve first of all a detailed forest survey, including a close stocktaking, and mapping; next, a suitable subdivision into smaller units or compartments for convenient handling; a study of the materials that can be marketed, and a study not only, but a stimulation of the market for the minor materials; next a study of growth conditions and their effect and results in regard to regeneration and in regard to increment. Based on this information an admissible felling budget may then be calculated and the felling areas may be suitably located; finally, study and experiment is necessary to learn how the local silvicultural difficulties may be overcome.

These are the data which must be ascertained in order to formulate a working plan and to inaugurate a technical management. There is no need here, I hope, to insist on the necessity of employing men with professional training to collect these data and to apply them; no need to insist that permanency of tenure of office and continuity of organization are essential to successful execution of the plans.

I propose now to point out a few illustrations of the kind of silvicultural problems that must eventually be solved by experimentation, those that arise in attempts to secure a new crop of desirable character.

Each reserve has its special problems, according to its character and composition.

The Aspen Problem.

In the Riding and Duck Mountains, we find conditions and problems very much alike. The most valuable species here at present in the white spruce, hence it is this species for which the management would have to be devised, especially as at least 60 per cent. of the soil is adapted to this species.

Unfortunately, numerically, another species, the aspen, is most prominent, as a result undoubtedly of fires which in past ages and also in modern times have reduced the spruce to only a limited amount; hence the spruce must be re-established in competition with the aspen.

There is no difficulty on this ac-

count, in the nature of the two species, for the spruce is a tolerant species and can stand the light shade which the aspen gives, almost without being retarded in its growth. The only problem is that of the profitable or at least costless removal of the surplus of aspen.

Aspen is by no means a useless weed tree. Not only is it valuable as a mere soil cover, recuperating the soil after fires, but it furnishes an acceptable fuelwood and pulpwood, and even an inferior grade of lumber, especially for flooring. Aspen also lends itself to use for small woodenware, boxes, crates, pails, excelsior. The establishment of industries near or in the reserves using this material is probably possible and should be brought about by investigating the possibilities of securing a sufficient supply of the raw material and other factors favoring such industries.

Unfortunately, it is liable at an early age to rot. Large areas of mature aspen, which look as if they would cut satisfactory saw material, are to the extent of 50 to 80 per cent. "punky," and so far as known useless. The silvicultural problem of re-establishing the spruce must wait upon the solution of the technological problem of finding a use for "punky" wood, or a use where at least a certain per cent. of rot is not objectionable.

Such large areas of pure aspen of all ages are found in these and other reserves that it will become an unavoidable necessity to work in part for aspen reproduction, and in that connection to solve the problem of reducing or stopping the progress of the disease, keeping it out of the younger growths that are not yet affected.

The aspen problem is, indeed, a general one throughout the whole Eastern Dominion; the development of its profitable utilizations should be made one of the studies of the Forest Products Laboratories.

Underbrush Problem.

There is little or no difficulty in establishing spruce under aspen of the shade endurance of the latter, but another, worse inimical agency comes in to make difficulty. The light shade of the aspen favors the establishment of a dense underbrush, especially of hazel, with an admixture of half a dozen other shrubs. This underbrush, keeps out the spruce, keeps it from establishing itself by natural seeding, and would choke it out if planted, and hence must be removed before a young crop of spruce, and even of aspen, could be established. Experiments are needed to determine the cheapest effective method of dealing with this trouble.

The inquiry would be as to whether cutting or burning produce the more favorable conditions and at what time of the year it is best to do the one or the other.

Planting Problems.

The desire of the forester is to secure his crop, if possible, by natural regeneration; that is, to so handle the mature crop that the seeds falling from it establish the new crop before the seed trees are all removed; this in order to avoid the outlay for planting. But there are large areas in these Reserves on which no old crop of desirable species is to be found, and it becomes necessary to establish such species by planting. The problem, then, is to find the most suitable species and the cheapest successful manner of propagation.

To gain an insight as to what species to introduce, trial plantations on a small scale are indicated.

It is my impression that not only in the aforementioned forestless reserves, and where desirable species are lacking, but also in the well wooded ones, planting will be found often preferable to reliance on natural regeneration.

While the apparent economy in relying on Nature's ability to estab-

lish a new crop is in favor of natural regeneration, avoiding the cash outlay necessary to start the crop by artificial means, sowing or planting by hand, in the end result the latter often proves the cheaper.

To use Nature as a planter requires knowledge, judgment and skill not only, but lucky weather conditions of the ground for germination and growth of the seedlings. This combination of favorable circumstances does not occur frequently. On the other hand, by growing seedlings in nurseries where they can be given the best care, and setting out plants, success can be forced, and especially time can be saved.

Hence, early attention should be given to finding out the best materials and methods of planting.

Jack Pine Problem.

Large areas of sandy soils are covered with a dense growth of pure Jack pine, standing so dense that each tree has little chance for development, hence the individual development is extremely slow. By reducing the number per acre, i.e., by thinning, as it is technically called, the remaining stand can be given opportunity for better development.

The problem is to find out at what time of the life of the stand to thin and how many trees to the acre promise the most satisfactory result.

The most valuable use of the Jack pine is for railroad ties, and it would, therefore, be desirable to grow tie trees. For this purpose, there is no need of freedom from knots, hence branchiness is no objection, and the increase in increment due to fully developed crowns that can develop in open stand may be secured without injuring quality. That means an early and severe opening up is indicated, only taking care not to expose the soil too much at a time.

The Jack pine is a rapid grower when young, but not persistent, hence this tendency should be utilized by giving it a chance to develop its rapid rate early. This may, perhaps, be done by reducing the number in the stand early to say, 300 or 400 trees per acre or perhaps even less.

The narrow-minded manager will object that the operation would not pay because, perhaps, he could not dispose of the material coming from the thinnings profitably, but if it could be shown that instead of having to wait 80 to 90 years for a 5-tie tree to develop, a full crop of railroad ties, 1,500 to the acre, could be produced in 40 to 50 years, the profitableness of the operation might justify its inauguration even without the possibility of disposal of the thinnings. Experiments, then, for determining the most satisfactory density of these stands should be undertaken at once.

The possibility of shortening the time of production of sizeable materials by a rational thinning practice has even in Germany been fully realized only during the last 30 years, and now, not only are from 25 to 50 and more per cent. of the final harvest crop secured by thinnings, without reducing the amount of the harvest crop, but the rotation as far as it is designed to produce sizes can be reduced at last 20 years.

It is desirable to institute thinning experiments in other than the Jack pine stands.

The Muskeg Problem.

Such experiments suggest themselves at once also for the Black spruce stands on the peaty muskeg areas which occupy such large extent in the reserves, and usually grow in overcrowded condition, retarding the development to size of the single individual. Whether by thinning, the rate of growth can be changed could be easily found out. The probability, however, is that lowering the water-table would show better results.

Altogether, the problem of the

proper use of these extensive peat bogs is one that should early occupy the attention both of the Forestry Branch and the Agricultural Department, for there is hidden in them a great resource that it has so far not been given to us to fully realize.

Fallen Timber Problem.

In the Rocky Mountain Reserves fires have killed large areas of mature growth, and as a result there are thousands of acres of windfalls covering the ground with a labyrinthian maze of down trees, which make the areas almost inaccessible and unmanageable for cropping. What can be done with this unfortunate condition? After some time this material rots, disintegrates and becomes a part of the soil, but in the alpine climate this process takes a long time.

Meanwhile, these areas form also dangerous fire traps.

Here again, the Forest Products Laboratories may be able to work out a solution, devising means of utilizing such material.

Altogether, the problem of finding use for minor wood materials is one that would often make it economically possible to solve the silvicultural problems.

There are, then, a host of problems which it takes time to solve. Their solution should be attempted at an early date. This is possible by experiment on a small scale before the necessity of solving them on a large scale arrives. But it should be realized that the answers to these inquiries by experiment come as slow almost as the crop itself for which they are made.

Therefore, the time to inaugurate them is now. Fortunately, the experiments outside of requiring careful and judicious planning can be made with very small expense, and considerations of economy, due to the exigencies of the war, need, perhaps, not delay them.

"HARM ME NOT!"

Following is an interesting placard which, says the British Journal of Forestry, is a copy of that affixed to the trees in Spanish forests most frequented by the people. The translation is as follows:

"To the Wayfarer,—

Ye who pass by and would raise your hands against me, hearken ere you harm me.

I am the heat of your hearth on cold winter nights, the friendly shade screening you from the midsummer sun, and my fruits are refreshing draughts quenching your thirst as you journey on.

I am the beam that holds your house, the board of your table, the bed in which you lie, and the timber that builds your boat.

I am the handle of your hoe, the door of your homestead, the wood of your cradle, and the shell of your coffin.

I am the bread of kindness and the flower of beauty.

Ye who pass by, hear my prayer: harm me not."

Tree on Tree

A singular tree in Cuba is called the yaguey-tree. It begins to grow at the top of another tree. The seed is carried by a bird, or wafted by the wind, and, falling into some moist, branching part, takes root and speedily begins to grow. It sends a kind of thin, stringlike root down the body of the tree, which is soon followed by others. In course of time these rootings strike the ground, and growth immediately commences upwards. New rootings continue to be formed and get strength until the one tree grows as a net round the other. The outside one surrounds and presses the inner, strangling its life and augmenting its own power. At length the tree within is killed, and the parasite that has taken possession becomes itself the tree.

Planting Snowbreaks on Railways

What Canadian and American Experience Has Shown Thus Far —Cutting Down Cost of the "Snow Crop."

The following article from "The North Woods" will interest readers of the Journal. The difficulties of "the snow crop" have been faced equally by our Canadian railroads and the planting of trees as a permanent solution for snow troubles has been recognized for some years. The Intercolonial Railway performed some windbreak work but, according to present information, did not maintain the plantations. The Canadian Pacific on their western lines have planted windbreaks extensively, and similar work on the eastern lines will be commenced this spring. It is understood also that the Canadian Northern have been investigating the matter. The practice on Canadian Pacific western lines has been to use willow and broad-leaved species which have the advantage of speedy growth. It may be that spruce or other conifers will be found useful for the purpose. This is a point which the experiments thus far have not successfully determined.

"Those most closely interested in harvesting the snow crop—aside from a few over-zealous men—are the railroads. There is always a certain amount of snow—or rather a very uncertain amount which shows a tendency to collect in the railroad cuts or on the prairies. The railroad men are interested in corralling that snow before it gets into the cut. They are all convinced that it must be corralled, but the best method of doing it is still in doubt.

It was to discuss this important question that the representative of eight railroads and of the College of Forestry met in the office of the State Forester on the morning of March 20. The live snow fence was the object of discussion. For many years these railroads have been patiently building portable board fences at a cost about $3.50 per rod, laboriously distributing along the cuts every fall and collecting them every spring at a further cost of at least fifteen cents per rod, and with the full understanding that a new set of panels would have to be constructed at least every five years. And even at that the results have not always been satisfactory.

The Work of Testing.

Many of the roads have tired of feeding this financial leak and are attempting to replace this temporary and expensive fence system with a permanent snowbreak of trees and shrubs planted along the right of way. It is pioneer work along this line, and subject to all the derision and doubts that such new ideas are heir to. Some are skeptical, some confident, but all of them who have taken up the work are spending considerable money on it. Naturally much of the work is of an experimental character because no one knows just what kind of a snowbreak will be most effective; what species to use, how to place them or how to plant them. Up to the present each one has been groping on alone with but little idea of what the others were doing. This meeting was called to effect an exchange of ideas, and see what could be learned from all the experience of the different roads viewed in the aggregate. The result was well worth while.

The Great Northern has been doing more of this work recently than any of the other roads and doing it in a very systematic way. Mr. Mouck's report of the methods they were using and the results were most interesting. He described their methods as follows:

Wherever the snowbreak was to be planted, the right of way was widened sufficiently to keep the inside of the planting one hundred feet from the centre. A strip fifty-six feet wide is broken about four inches deep and rolled or disked. This is then backset to about the same depth in the fall. The following spring this same land is deep plowed, from twelve to sixteen inches with a Spalding subsoil plow drawn by eight horses. The next spring, that is in the spring of the third year, it is ready for planting. This method was generally approved as the most efficient.

Nursery Stock.

The stock, raised in the company nursery at Minot, was planted in five rows eight feet apart and four feet apart in the rows. A row of shrubs on the outside, spaced closer, two rows of willows and two rows of some taller species. Eight feet of cultivated ground was left on each side of the plantation to serve as a firebreak. The planting was done by the section crews, and extra gangs were needed.

The shrubs found most satisfactory were the caragana and the artemisia, though the latter has not been used extensively. The golden, the laurel leaf and the white willow have all been tried. The laurel leaf was a little freer from insect attack than the others. The cottonwood had been used most for the taller species on the inside, but had proved of very little value as a snowbreak. All seemed agreed that the willow formed the most effective element in the break and Mr. Mouck strongly advocated a pure plantation of willow, discarding the other species. He was anxious to get information on the suitability of evergreens, but very little experience with them was available. He did not doubt that a properly selected plantation, one with a row or two of low, bushy growth and a few rows of some higher species, would stop the drifts but had not experimented enough to be able to say definitely what species should be used. The others all agreed that there was no question of the satisfactory service of a live snow fence and that the only problem was the selection of the most suitable species and the determination of the best methods of planting and soil preparation. The only places where plantings have been markedly unsuccessful are the alkali spots and Mr. Mouck thought this difficulty could be overcome by the proper deep cultivation to break up the hardpan.

"Let the Trees Do It."

Mr. Welsh, of the Omaha, cited the best examples of a live snow fence that was really doing business. About 1880 the Omaha planted groves for the protection of the cuts on their main line in Minnesota. These were of mixed species planted on land bought outside of the right of way or on land where the perpetual right to maintain a grove was leased. The trees were cultivated for six or seven years, but no care has been taken of them since. For thirty years these groves have absolutely prevented snow trouble. While the other roads have been laboring with the snow fences, the Omaha has been sitting back and letting the trees do the work. At a very conservative figure, the cost of maintaining snow fences for these thirty years would have amounted to $35 per rod, or $11,200 per mile. In one place where a cut was lengthened, so as to extend beyond the protection of the grove, trouble is experienced every winter. This testimony leaves no doubt of the efficiency of the live snow fence.

And experience seems to show that there is also very little doubt that they can be successfully grown.

One Hundred Trees Per Man.

Mr. Hoverstad, of the Soo, cited much the same experience as Mr. Mouck. Hobo labor had proved too expensive. One hundred trees per man per day was above the average. For this reason, the Soo expects to experiment this coming season with a new tree planter and a power cultivator. They are fully convinced of the wisdom of the tree-planting policy. The planting has to be done at a time when farm labor is fully employed.

Some of the other roads had done some tree planting for this purpose, but were unable to give any very definite account of the work."

Windbreaks on C.P.R.

The Superintendent of the Forestry Branch of the Department of Natural Resources, C.P.R., has given the following information:

"The work was started in 1908 and it took two years to get the ground ready for planting. The prairie sod had to be broken the first year, then backset and summer fallowed in order to accumulate sufficient moisture for tree growth. The conditions affecting tree growth east and west of Moose Jaw were found to be absolutely dissimilar. East of Moose Jaw trees planted three years can be left without any further maintenance; west of Moose Jaw it is necessary to cultivate each year in order to keep the trees free from weeds, which would deprive them of needed moisture. The district west of Moose Jaw is in what is known as "The Dry Belt." In territory similar to this in the United States one of the railways tried watering the trees, but that is a mistake; cultivation is all that is needed.

"The cost of the portable panel snow fence anywhere in Western Canada, Minnesota, Dakota, or other western states is from $2.39 to $2.51 per 16 ft. panel. The depreciation and annual maintenance per 16 ft. panel is 47 cents. The cost of 16 feet of tree fence, including three years maintenance, is $1.95. The three years cost of maintenance is necessary before the fence may be said to be established; west of Moose Jaw it may take five years.

"The tree snow fence has been remarked upon by hundreds of tourists, and has helped very considerably in demonstrating to intending settlers the possibilities of proper cultivation in the dry areas. The tree snow fence also is just as good, if not better, than the panel fencing."

May Tax N. B. Lands

The question of how to raise more revenue was discussed by many supporters of the Government in the New Brunswick Legislature recently, and the resolution of J. L. White, proposing to place a tax upon granted lands not included in the school districts was enlarged upon and an amendment offered by L. P. D. Tilley to have a committee of the House inquire into the advisability of taxing both crown and granted lands was adopted. There are 7,000,000 acres of crown lands and it is said about 4,000,000 acres of granted lands. Some propose a tax of two cents an acre upon crown lands, which would yield about $140,000. An equal tax upon granted lands would bring $80,000, but it is said some propose that granted lands shall pay four cents per acre, which would yield a revenue of $160,000, or $300,000 in all. The Speaker appointed Messrs. White, Carter, Mahoney, Jones, Culligan, Woods, Hachey, Tilley, Lockhart and Slipp as the committee for this purpose.

At the Berthierville P. Q. Forest Nursery:—White pine seed germinating under bag-cloth set on wood frame. This is a very good seed cover; it guards against the devastation of birds and also gives valuable protection to the soil.

Canada at War

By Dr. C. D. Howe,

of Toronto University Forest School, in "The Biltmorean."

One thought is uppermost in the minds of all Canadians, that is to do their "bit" in the service of their country at this time, and they have succeeded beyond their own expectations, not only in furnishing men but in performing the innumerable services contingent upon war. Evidences of the spirit of service and concentrated effort meet one at every turn. One sees women knitting socks for the soldiers at the church and theatre, in the street cars and even as they walk on the streets. There are no more bridge parties, dinners or other social functions for their own sake. Women now meet to work. A lady of my acquaintance has knitted over a hundred pairs of socks, besides spending nearly every afternoon and evening engaged in the various phases of war relief work. A former society leader has spent six hours a day for a year in a dingy store-room, collecting and packing clothing for the Belgian relief—and she has also become worn and white-haired in the service. Every woman has found some way in which to help. There are certainly no "slackers" among them.

Children Do Their Bit.

The children in the schools make scrap books for the soldiers and contribute their pennies for war relief. The older boys have their cadet corps. Churches, Sunday schools, fraternal organizations, boards of trade and business houses are mobilized for service in some form.

The voluntary contributions of money during the past year have been enormous. Five million dollars were contributed to the Patriotic

Fund, which goes to the needy families of soldiers. The estimated cost of such work the coming year is $8,000,000. Toronto's share in that will be $2,000,000, and the plan is to raise this in a three-days' campaign. Several million dollars have been given to the British Red Cross. Toronto raised a half million dollars for that purpose in one day. The staff and students of the university shared in this to the extent of over $4,000. The Canadian Red Cross has collected over a million dollars in connection with its work. Many towns, cities and business organizations have donated motor ambulances, hospital supplies and even machine guns. The university raised $40,000 to establish a base hospital (now reported to be at Saloniki) and $60,000 for running expenses. The university women have undertaken to furnish the necessary supplies for the hospital. The teaching staff of the university established a chair for a professor from the University of Louvain, and he is now giving courses here.

The Clash of Arms.

As I write this, a company of soldiers is marching past with a band playing a pulse-quickening air. About 12,000 soldiers are now being quartered in Toronto, and men are enlisting in the city at the rate of about 200 per day. Up to Christmas, Canada had raised 207,000 soldiers and on New Year's day the call came from Ottawa for enough to bring the total number up to 500,000. The population of Canada is, or was before the war, close to 8,000,000. So when the enlistment reaches half-million, the proportion will be one to every sixteen of the entire population. If we estimate that one in eight of the total population is male of military age, then, when the latest call for men is supplied, one-half of the military strength of the country will have been recruited, or in other words, Canada in the pinch can raise one million men. However, those of military age but unfit should be deducted in this estimate. The men rejected are now running at about 25 per cent. of those offering their services.

The British war office has estimated that the wastage of men from all sources is 15 per cent. a month, or in other words, the armies at the front must be completely renewed by the end of each seven months period. From this statement, if he knows what numbers are now engaged and what numbers of recruits are available, one can figure out how much longer the war can last on the basis of the present activities.

Foresters to the Front.

The university has responded generously to the needs of the war. Six hundred undergraduates and 85 members of the teaching staff have already enlisted. Over 900 recent graduates have also offered themselves. This makes the university's contribution over 1,600 men. The Department of Forestry has probably contributed a larger percentage than any other department in the university, as there has been a decrease of 70 per cent. in the number of students since the beginning of the war, the registration at that time being fifty and now only fifteen. And moreover, only one-half of those who enrolled last October are now present. We have a few students not of the military standard and they are all we expect to have left at the end of the school year, for practically every able-bodied man will enlist, unless the atmosphere clears in the meantime. That is the spirit throughout the university. Nearly every man is drilling. The campus is covered with men in khaki from 4 to 6 o'clock in the afternoon. During these cold days the corridors of the university buildings, once sacred to mental and spiritual strivings, now resound to the clash of arms. The students are organized into an officers' training corps. The successful get a lieutenant's

commission, either in the Canadian forces or in the British army overseas. Thirty-one went over to take commissions during the Christmas vacation and another bunch will go next month.

The New Brunswick Forestry School, the Dominion Forestry Branch, and the various provincial forest services are being restricted in their work through enlistment. Of the graduates of our school employed in forestry work, some fifty in number, 40 per cent. have enlisted up to date. The forest services have lost their non-technical men, such as rangers, guards, etc., in about the same proportion.

Canadian Timber for Government Works

Henceforth Canadian timber only is to be used in all public works undertaken by the Dominion Government. Such a policy can very easily be followed, so far as supply is concerned, for it is a fact that Canada is one of the greatest of tree-growing lands. Except in the prairie country, the forest is never far distant, and in it are to be found trees suitable for practically every work in which wood enters. With proper management, which is now being attempted on a considerable scale, supplies need never become exhausted. It is not a difficult matter to allow, and help, new forest crops to grow where trees are cut down for industrial purposes.

There are many varieties of big trees in Canada, a score of which are well-known and plentiful, and which are used for various purposes. The largest is the Douglas fir, named after David Douglas, who discovered its worth as long ago as 1825. This truly splendid timber tree ranges in height from 175 to 300 feet and has a long, clear trunk, from which large timbers of even diameter are secured. The wood is employed in heavy construction work and for masts and poles. The Douglas fir's habitat is British Columbia, and also the Rock Mountain part of Alberta. In the same territory, also, grows the western red cedar, very much in demand for shingles, interior woodwork and doors. Other cedar trees are to be found from Manitoba to the Atlantic, rising to a height of from 50 to 60 feet. Their wood is valued for its rot-resisting qualities. Fence posts and telegraph poles are made from cedar.

The emblem of Canada is the maple leaf, and the beautiful tree on which it grows thrives wherever the land is good. There are several species and the hard or sugar maple is the most valued hardwood tree in the country. Its wood enters into furniture, flooring, shipbuilding, railway car construction, tool handles, etc. In the forest the maple rises 100 feet and more and has a diameter of from two to five feet. The Canadian oak is about the same height and is put to much the same uses. Hard birch is employed most extensively by manufacturers, especially in the making of cars, carriages and furniture. The elm furnishes strong, tough wood, and the ash tree is favored by the producers of baskets, barrel hoops, boats, coars, ball bats, and like articles. The spruce tree, which ranges from the Atlantic to the Pacific, gives a soft light wood, much used for lumber and pulp for paper-making. Other useful timber trees include the chestnut, cherry, hickory and the basswood. Indeed, the trees of the Dominion are of many varieties and in sufficient quantity to fill every need. They are a great source of national wealth.

Destroying Shade Trees

(Ottawa Citizen)

Complaints are being made to the civic authorities of the vandalism of local companies whose extensions of wires necessitate the removal, in whole or in part, of trees on civic property. It is alleged that trees on residential streets are being virtually destroyed in many cases by wire stringing crews and that when protests are made the answer usually given is that civic permission for the removal or mutilation of the trees has been secured. The city engineer's department, however, denies that such permission has been obtained unless the work is done under the supervision of a representative of the department.

Trees on civic property (on the street) are the property of the corporation. No private company or individual has the right to interfere with them unless by special permit from the engineer's department and under the supervision of an official from that department. It cannot be too strongly impressed upon householders and others that every mutilation of trees under other circumstances is a violation of the civic regulations, and the perpetrators thereof are liable to the penalties prescribed for such offences.

The matter is one that concerns the health, comfort and beauty of the community. The remedy for the present epidemic of tree mutilation is in the hands of the citizens and it is to be hoped that it will be promptly applied whenever necessary. The city is prepared to deal with all such cases and unless the regulations are promptly and permanently complied with by the companies responsible for recent infractions legal action would appear to be alike desirable and necessary.

Will Reach the Boys

(From "Industrial Canada," organ of the Canadian Manufacturers Association):

"The Canadian Forestry Association are to be complimented and praised for the admirable little "Boy Scout's Forest Book," just produced for presentation to the sixteen thousand members of the Boy Scout organization in Canada. The objective, of course, is to get the boy scout interested in the highly important task of preserving our forest resources from destruction, and this has been done in a skilful way. By means of numerous interesting illustrations and a letterpress by Robson Black, which is as good as a story, the boys of Canada will undoubtedly be attracted and inspired to do their share for the preservation of the forests. The booklet is distributed free by the Association."

Settlers' Fires

Discussing editorially a lecture given recently by the Secretary of the Association in Cobalt before the Canadian Clubs of Temiskaming, the Cobalt Nugget, which circulates largely in the Claybelt section of Ontario, wholly approves of better Government control of forest protection on non-agricultural lands. Says this paper:

"Although it is humiliating to acknowledge the offence, Canada is the greatest forest destroyer of the world. Statistics of no other country will show the enormous losses of standing timber due to forest fires than official figures of Canada reveal. And the majority of the fires which are responsible for a big monetary loss to this country every year are caused by lack of care by the settler in setting out fires to burn up his slack in the process of clearing the land.

The aims of the Association are commendable. The society does not desire to keep under forest the land that is specially suited to agriculture. The objective of the members of the body is to introduce Government inspection and supervision of the system of fire ranging in every

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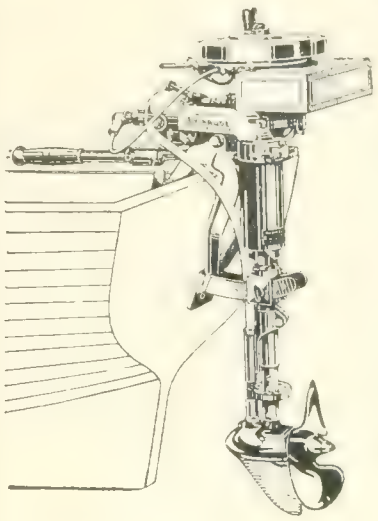

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province of the Dominion and educate the settlers to use the utmost care and judgment in setting out fires in order that destructive conflagrations may not spread and result in the loss of much valuable timber. The man who goes into any new country in order to clear and cultivate land should be accorded the maximum freedom and encouragement. The least hindrance possible should be put in the way of the settler, and every acre of real agricultural land should be placed under cultivation. As pointed out by Mr. Black, there is no desire to conserve the forest growth on land that will grow grain or vegetables, but one object the Forestry Association has in view is to save the people the forests which are growing on soil that is fit for nothing else.

There is really no excuse for a loss of several million dollars every year in Canadian timber. If proper steps are taken the steady depletion of the forests by fire and careless cutting may be averted."

To which the Kenora 'Examiner' adds:

"It happened during the last gold rush in this district that prospectors started bush fires to bare the rocks so as to make prospecting easier. This should entitle the starter to a job in the penitentiary."

Supervisors Meet

A very successful Supervisors' meeting was held at Calgary from February 28th to March 7th inclusive, by direction of Mr. E. H. Finlayson, District Inspector of Forest Reserves. It has been the practice to call the Supervisors in to Calgary once a year for the purpose of dis-

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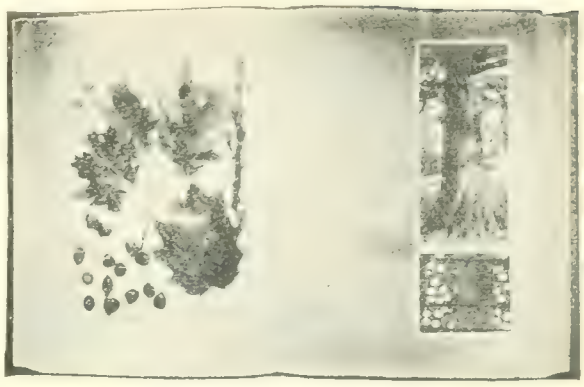
cussing all sorts of administrative problems but the last meeting was made more general and two Forest Assistants and two of the best rangers were added to the attendance. One of the most interesting features of the meeting was a telephone demonstration given by Mr. M. E. Deering, of Winnipeg, representing the Northern Electric Company, which was found of exceptional interest.

The following were in attendance: Mr. Finlayson; Mr. C. MacFayden, Supervisor Athabasca Forest; J. Y. Greenwood, Acting Supervisor Bow River Forest; S. H. Clark, Supervisor Brazeau Forest; A. E. Austin, Supervisor Clearwater Forest; R. M. Brown, Supervisor Crow's Nest Forest; W. W. Badgely, Supervisor Lesser Slave Forest; Forest Assistant Manning of Clearwater Forest; Forest Assistant Macdonald of Bow River Forest; Forest Ranger Bleffgen, Crow's Nest Forest; Ranger Hutchison, Brazeau Forest.

Disappearing Forests

Of the dense tropical forests of mahogany, cedar and other valuable hard woods that once covered the islands of the Carribean, there are left among the Northern Islands, only Dominica in the Leewards and St. Lucia in the Windwards that have any portions of these forests still standing. In Barbados, Antigua, Montserrat, St. Vincent and Grenadad, the forests have disappeared. Trinidad, Jamaica and British Guiana, however, have escaped denudation, on account of the difficulty of reaching the interior since no rail nor waterways exist by which the lumber could be got out. In these colonies although the coast line has been cleared and lumbering operations pushed for a few miles into the back country, a large area of timberland still remains in each colony from which is annually drawn a considerable "cut."



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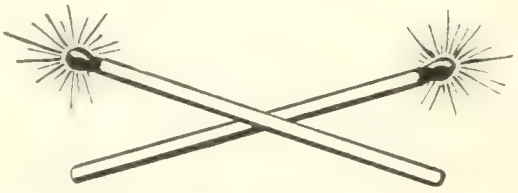

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An interesting lecture was given recently on the subject of Canada's forest wealth by Dr. J. S. Bates, Superintendent of the Forest Products Laboratories, before the Natural History Society, Montreal.

The forests of Canada, he explained, extend from the Pacific to the Atlantic. British Columbia had half the timber in the Dominion. Coming east one finds large forests on the northern side of the prairie provinces, while there are good forest lands in northern Ontario, extensive areas through Quebec, fairly well covered lands in New Brunswick, and rather limited ones in Nova Scotia and Prince Edward Island.

It should be remembered, he said, that the amount of merchantable timber in Canada is only about one fifth to one fourth of what still remains in the United States and for this reason everything possible must be done to increase Canada's forest resources. Canada, however, still stands third among the nations of the world as regards her forest wealth. Russia comes first, the United States second and then Canada. It is estimated that about 60 per cent. of the land area of Canada is good for nothing else but the growing of trees, therefore the forest must be considered as a crop which can be made perpetual and immensely valuable by proper methods of handling.

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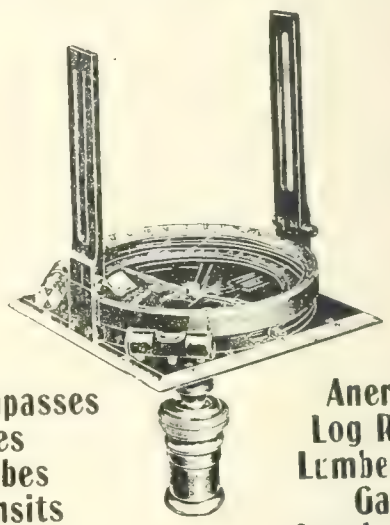

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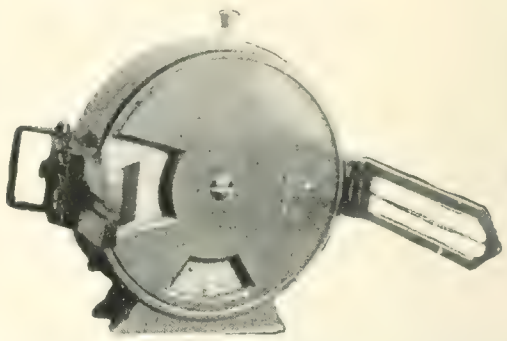

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VOL. XII. MAY, 1916. No. 5.

(Printed at Kingston, Ont.)

Forests and the Prairie Provinces

The Imperative Problem of the Future Wood Supply of Canada West Told From a New Angle.

[Reproduction of a brochure written by the Secretary of the Canadian Forestry Association and presented to the members of Western Boards of Trade, etc.]

To the People of Western Canada:

This brochure talks of forests. Forests and the things they provide are as much the foundation of prosperity in Manitoba, Saskatchewan and Alberta as in Ontario, Quebec and New Brunswick. Most of us have thought that the prairie provinces had little to do with forests, but that is mostly because forests do not advertise.

You know your own town!

The buildings are made of wood. The trimmings and floors are wood. You kindle your morning fire with wood, you stand before a wooden dresser, open a wooden door, seat yourself on a wooden chair at a wooden table, read a newspaper made of spruce, balsam, poplar, scanning despatches that leaped across thousands of wooden poles, spend five minutes in the garden with a wood-handled rake, walk along a tree-shaded avenue to catch a half-wooden street car, enter an office lined and furnished with wood, take your place at a wooden desk and prepare to write with a wooden pen.

And yet you sometmes wonder what interest the Western town has in its native *wood crop*.

The Farmer and His Wooden Farm.

You are obliged to make a journey. The railway coaches are mostly wood, and run over wooden ties, past stations constructed mainly of timber. You leave the train, cross a wooden platform, and drive in a wooden democrat to a farmer's wooden home. Two hundred acres he has hemmed in with wooden fence posts procured at little expense from nearby woodlands. Great wooden barns that in due season will receive the harvested wheat! In the fields the wood-and-steel binders whip merrily into the standing grain. On the next concession a wooden threshing outfit is clattering northward. Secure from the weather, three plows, a hay rake or two, a grain wagon, a buggy and a spare wagon tongue are crowded

against a wooden wall; you imagine you see the scores of implement factories carefully fitting these pieces of ash and maple and elm to their casts of steel.

Surely, you say, this is an age of *wood*. What railway could move, what farmer could sow or reap, what townsman could more than eke out an existence without the helping hand of forests?

You are on the train again. That thought about the wood supply of the Western Provinces for farm, for home, for transportation, has temporarily been laid aside. The engine whistles shrilly. Here evidently is a coal mining town. Hundreds of homes are spread about; there is a winding street of stores.

More Than a Localized Question.

A mine manager steps aboard. He is an old acquaintance and you soon have him in conversation. It does not take long to announce your speculation about the need of wood to carry on the business of Canada West.

"Of course," you say, "this is a farmer's and a merchant's question. You mining men doubtless see nothing to get alarmed about."

"Nothing, eh?" his face lightens up with surprise. "Let me tell you. To get a single ton of coal out of the ground requires two lineal feet of timber for pit props. Where do we get it from? Right at the doorstep of the mine, so to speak, for mine timbers cannot be hauled long distances, or the price of coal would be prohibitive.

"Thirty years ago Alberta and Saskatchewan turned out about 1,600 tons of coal. By the last returns, Alberta alone is producing yearly over three million tons and Saskatchewan over 175,000 tons. *That means we need about six and a half million lineal feet of timber a year.* Do you know where we're going to get it?"

You confess that you hope the country has sufficient to keep the coal mines running.

"But that is not meeting the problem fair and square," opposes the mine manager. "The Geological Survey says that Alberta possesses a million million tons of lignite coal, Saskatchewan over 59 billion tons, and Manitoba 160 million tons. Wonderful resource, say you? But wonderful and valuable only as it can be set to work. What sets it to work? an abundant and cheap supply of mine timbers in the neighborhood of the mines. The biggest perplexity of many of our Western Canada coal mining companies is not market or transportation or tariff, but the future supply of near-at-hand mine timbers."

New Industries Demand More Coal.

"The huge increase in coal consumption in our Western Provinces is due not only to the advancing population but to the incoming of new industries and extension of railways. Indeed the coal production is out of all proportion to settlement. In thirty years, population in Alberta and Saskatchewan multiplied over twenty-three times, while the output of the western coal mines multiplied 2,000 times. In a very few years the present coal mining plants will be taxed to their utmost capacity. What follows? They add to their plants, of course. But can they lay their hands on local supplies of mine timbers as easily as they can get boilers and conveyors? I very much doubt it. The mine managers and shareholders and workmen also doubt it. This business of mine props is staring the West in the face. What are we going to do about it?"

You return to your home in the prairie city, resolved that the matter must be sifted further. You seek information in very many quarters. This is about how it works out:

If Manitoba, Saskatchewan and Alberta are to produce goods—agricultural or industrial—at the least possible cost, the expense of raw materials must be held to the minimum.

If the farmers of the three provinces are to reap higher profits from their investments and labors, not only must their produce be sold high, but their costs must be kept low.

If the towns and cities are to attract new industries, such as lumber, saw mills, pulp and paper, box-making, cooperage, furniture, etc., etc., raw materials must be procured abundantly and cheaply with the shortest possible freight haul.

If the magnificent coal mining industry is to realize on the great stores of natural riches the *costs of mining must not be unnecessarily multiplied.*

Forest products are a Western *essential.* No one looks on cheap fence posts, cheap lumber, cheap fuel as a luxury. The West *must have them,* and at the lowest possible cost.

Look After the Foundations!

The towns and cities reasonably expect to secure thriving industries utilizing wood products. The spruce and poplar of the prairies are the best species for making pulp and that manufacture opens up a field for many varied products and industries. Most municipalities of the West are looking forward to the day when industries will add to their population and prosperity. But what will give support to the industries if forest products have been blotted out?

The West possesses enough water powers to over-supply a populous nation. Water power development is possible in almost all parts of the country and is the keystone in any scheme of large industrial expansion. Irrigation is bringing millions of otherwise arid acres under revenue-producing crops.

But water powers, whether for turbines or irrigation ditches, are not self-contained. They measure their value by their uniformity of flow. That uniformity is largely a question of abundant forest growth on the watershed of the streams. A stream without heavy forest growth to act as a natural storage reservoir is not dependable and loses a big part of its commercial value. The forest growth of Western Canada is not only a source of rich raw materials for immediate and future use, but represents the commercial availability of the water powers and irrigation projects.

What Future for These Reserves?

What, then, of the ability of the forests of Western Canada to meet the demands of present and future?

The forests of Alberta, Saskatchewan, and Manitoba gathered up in the Forest Reserves under the Dominion Government amount to over 25,000,000 acres. These reserves have been racked by forest fires in the past, but are now receiving protection. Those that are denuded of trees will be reforested as soon as possible and on those covered with trees steps will be taken to introduce more valuable species where advisable. The reserves are a valuable source of supply for fuel and small timber. *They must be carefully protected and developed for years to come* if they are to play their logical part in the commercial future of Western Canada. Ultimately, their contribution to the public service will be supplemented by the matured woodlots of the prairie farmers, for which four million trees are now being distributed annually by the Dominion Forestry Branch.

The Part You Should Play!

If the prairie provinces are going to have the timber that they will require in the future for the buildings of the towns and villages and for the supplying of wood using industries, it is necessary to begin considering *immediately* where the supply is to come from and where it is to be located. If there is no local supply of lumber there will be nothing to regulate the cost and almost any price may be charged by the importer. The time to make sure that the future prices and supply of lumber will be kept under control is now. A crop of trees cannot be grown in one year like a crop of wheat, and it is necessary to decide a long time ahead what particular piece of land is going to be kept for producing timber. Fortunately timber will grow where nothing else will and the decision as to the lands on which the timber crops should be grown should be easy if it is once realized that the timber crop is essential and that a fair proportion of the land must be used for that purpose.

Photo by J. C. B.

Scores of islands and points are covered with spruce pulpwood. There is evidence that formerly much greater areas were similarly covered... A great fire some fifty years ago swept away the forest. The land, composed of rocks, is now covered by a growth inferior. Taken at Little Shell Lake, Churchill River Basin.

Your Decision—Then Your Action.

The thing to do is to decide now and set apart the lands required for growing timber, and to provide for protection, good management and reforestation where necessary. For proper protection of the valuable public property in forests men who are well qualified and reliable should be selected and the inefficency and carelessness of officials should not be allowed to waste the public wealth.

If you conclude that as a business matter this is one well deserving of your attention in the interests of the present and the future of the community you can best assure the carrying out of such a policy by laying your views before the authorities which are concerned with forest administration or before the representatives for your district.

Tragedies of the Trent Watershed

THE BEGINNING.

With the exception of patches containing a few square feet, there is on this prospective farm no soil that approaches a loam in texture. It is mostly gravel and sand.

THE END.

One of the many abandoned farms in the Trent Watershed. The amount of human energy expended in attempting to make a living from such areas has been and still is, enormous.

Why Action is Needed on the Trent Watershed

Canada has Spent Over $14,000,000 on Trent Canal Project While Basic Resources Have Been Turned to Waste.

Condition of the Trent Watershed.

Of the 1,171,614 acres in the lower watershed,

Eighty-three per cent. are still forest covered but only 700 acres are virgin forest.

Less than 90,000 acres have been moderately culled.

The rest have been severely culled and are therefore in unmerchantable condition.

Nearly 60,000 acres are waste lands, the results of fires.

Some 580,000 acres are covered with young and second growth trees.

Less than 12 per cent. are farmed.

What is Recommended.

The bulk of the country involved should be placed in, and managed as, a permanent forest reserve for the growing of timber.

The Provincial Government still controls about one-third of the area, partly under timber licenses, partly in cancelled and abandoned lots.

The municipalities are naturally closely interested in seeing as much of their land as possible put to profitable use in order to reduce the individual tax assessments and at the same time to permit of a higher degree of civilization through increased industrial activities and educational facilities.

Private landlords will be benefited by better protection. Permanent manufacturers can be established, industrial development will increase, and the public at large will gain in prosperity.

Co-operation of the three administrative agencies, the Dominion, Provincial and Municipal governments is especially needed to develop anything like a permanent forest policy.

The policy then should be to bring all the lands which are not strictly farm lands as rapidly as possible under the control of one or any of these three agencies.

Readers of the Journal will obtain from the foregoing excerpts of the Commission of Conservation's report on the Trent Watershed Survey, a glimpse of the problem which seems no nearer solution to-day than in the months of 1913 when public opinion was first shocked by the statements and deductions.

In these days of war, every energy of finance departments is bent upon the discovery of new forms of taxation. Millions are laid aside for the development of Government railways, oblivious to the fact that the absence of forest protection on these same Government roads is knocking the bot-

tom out of future freight revenues from forest products. Cautions are issued to the public to avoid waste, when one of the most flagrant forms of waste under all governments is the sacrifice of priceless timber, for lack of the elementary protective systems which are in force in nearly every part of the world outside Canada.

Over fourteen millions of dollars have been spent by the people of Canada on the Trent Canal, and yet the foundation of future revenues from local freight has been almost wholly demolished by the refusal of Dominion and Provincial Governments to place the remnant of unwasted timber under some system of protection.

Into the Trent Canal project fresh millions are directed annually. Yet the only hope for justification of these heavy expenditures is an abundant and controllable flow of water. "This factor," remarked Dr. B. E. Fernow in his report on the Trent Watershed question, "is of paramount importance to the canal. Engineers have sometimes thought that dams alone may effect the satisfactory regulation of the waterflow but the wiser ones have recognized that for the best service, dams need to be supplemented by a forest cover such as a watershed furnishes."

The subject as outlined in the following paragraphs from the Commission of Conservation report will give many readers hitherto unfamiliar with the grave situation along the Trent Canal a basis from which they can urge public action.

Eighty-five Years in Building.

"The Trent Canal project has been a subject of public criticism and often of ridicule, ever since it was conceived, 85 years ago. The criticism and ridicule are not, however, deserved by the original project but only by the irrational, slow manner in which it was executed. The canal project, in fact, has been subjected to precisely the same kind of management as the territory through which it passes. The chief value of a canal lies in connecting markets and resources, and, therefore, depends mainly on its outlets. The first outlet of the canal, the one into Lake Ontario, is now, after nearly a century of dilatory work, being completed; the other, which affords access to Georgian Bay, still hangs fire. So long as the outlets to larger markets or for through-traffic were lacking, only a very limited local traffic could develop. Since the principal resource of the region it serves was timber—a staple which needs more than local markets for a profitable and rational development—the value of the incomplete canal was limited indeed. Since this outlet was unavailable, the timber, owing to the expense of transportation to market, was cut in a more or less wasteful manner. As a result, the government derived scarcely any profit from this industry, and the returns to the lumbermen were also relatively small. If the cheap transportation which a canal furnishes had been in existence earlier, much more conservative logging operations could have been carried on; much closer utilization of material could have been made by mills situated along the route; much more profit could have been secured from this resource by both operators and the people, and, moreover, the source could have been managed for perpetuity, as a basis for manufacturing industries. As it is, the principal local freight, that from the timber-lands, is almost exhausted, and a large part of the usefulness of the canal has gone, as least in so far as local development is concerned. Outside of the water-power which it supplies, through traffic, which may follow upon the completion of the two outlets, can alone justify its existence for the present; unless by careful planning and management a revival of the in-

dustrial activity, to which, at one time, the lumberman gave rise, can be secured.

Forest and Waterflow.

Meanwhile, another important factor in the problem, which is closely connected with the timber question, has been entirely lost sight of, namely, the securing of adequate water supplies for canal and power purposes by the conservation of a forest cover on the watersheds. Indeed, this factor, the conservation of water supplies, is one of paramount importance to the canal. Whatever may be said regarding the influence of deforestation on climate, an influence which, it must be admitted, is only imperfectly understood, there can be no question as to the influence on waterflow which a forest cover exercises. That such a cover prevents extremes of low-water and high-water stages, and generally regulates and equalizes waterflow, has been proved both by experience and experiment in all parts of the world.

Engineers have sometimes thought the dams alone may effect the satisfactory regulation of the waterflow, but the wiser ones have recognized that, for the best service, dams need to be supplemented by a forest cover such as a watershed furnishes. Especially for city water supplies the practice of forestation of the watersheds has now been generally recognized as essential, mainly for the reason that erosion and the filling up of water reservoirs is thereby prevented. These explanations of the importance of the forest influence may perhaps serve to show the bearing of this survey on the Trent Canal.

Causes of Deterioration.

At the present time, the pine timber, at least, is practically gone from this watershed. A forest cover still exists, but, with the present commercial value almost entirely extracted, interest in its condition is gone; fires have swept through it repeatedly, each time causing further deterioration of the forest cover, until, finally, the bare rock condition or man-made desert is the result. At present only beginnings of these conditions can be seen here and there, yet in the three townships of Metheun, Anstruther and Burleigh alone, nearly 150,000 acres of such desert exist. And, if the present policy of indifference and neglect continues, what might have been a continuous source of wealth will become not only a useless waste, but through the changes which the water conditions will undergo, may also prove a menace to industries which have been developed to utilize the waterpowers of this watershed.

Here is a sample area of thousands of square miles in other parts of the Eastern provinces, and the conditions in this watershed are by no means extraordinary. They repeat themselves whereever axe and fire have been permitted to destroy the original growth in the Archean rock country, that is to say, wherever lumbering under the license system has been permitted, without safeguarding the property as a producer. The sequence of this mismanagement is everywhere the same. The removal either of the best or of all the timber, without disposing of the debris, leaves a slash which is invariably subject to fire; after this, a loss of interest takes place on the part of the licensee and, what is still worse, on the part of the government. Nature then attempts to reproduce the forest and this is followed by a repetition of the fires, which kill the seed trees and seedlings of the better kinds. The ground is then re-covered by aspen and birch for a time; but, through repeated conflagrations, it is finally rendered useless for any productive purpose. A similar sequence takes place in connection with the small-farm portions: at first, through the home market made by the lumber-

men, a fair living may be made by the occupant; gradually this market vanishes and the soil becomes worked out; the surface wears away, the rocks are exposed, and the people are left destitute and miserable.

The Farming Population.

There is still another reason for the prosecution of the survey and that lies in the fact that a portion of the population of this region occupies farms unfit for sustaining civilized conditions. Not only have many farms been abandoned by the removal of their occupants to more hopeful conditions, but a considerable number that ought to be abandoned remain occupied by those who lack the means and energy to move, thus forming a poverty-stricken community. A far-reaching policy for the management of this region must include a plan for the removal of this degenerating population.

The problem presented by this region requires the formulation of a broad and far-reaching scheme of development and recuperation. The water-flow should be safe-guarded, and industries should be developed to utilize such small resources as are left, and to contribute freight to the canal, thus assuring a better future for this area than can be anticipated under the present policy of indifference and neglect."

British Columbia Forest Club

At a Club meeting and dinner held recently in the Blue Room of Hotel Vancouver, Mr. O. P. M. Goss, consulting engineer of the West Coast Lumber and Shingle Association, Seattle, delivered a most interesting address on the uses of creosoted fir lumber. About thirty members of the Club were present, Mr. R. D. Craig, vice-president, occupying the chair. The after discussion proved profitable, Mr. Aird Flavelle bringing out some new points by judicious questioning.

The annual meeting of the Club was held in Vancouver on April 6th, when the following officers were elected for 1916-7: President, W. J. VanDusen, Forest Branch, Victoria; vice-president, R. L. Morse, Howe Sound Timber Company, Limited, Vancouver; programme secretary, Dr. Judson F. Clark, Vancouver; secretary-treasurer, John Gilmour, Forest Branch, Victoria; executive, M. D. Rector, International Timber Company, Limited, Vancouver; A. D. Flavelle, Thurston-Flavelle Lumber Company, Limited, Port Moody; R. D. Craig, Commission of Conservation, Vancouver.

An effort is to be made to increase the usefulness of the Club by arranging for more frequent addresses by men who are prominent in the various departments of the lumber industry. In line with this intention a hurried meeting was called for Monday evening, April 17th, at the Terminal City Club, Vancouver, to hear Mr. J. A. Newlin, of the United States Forest Service, who in the afternoon addressed the members of the British Columbia Lumber & Shingle Manufacturers, Limited, on the proposed scientific grading rules for Douglas fir, now being widely discussed by the manufacturers of Washington and Oregon. Later in the season the Club will be addressed by the chief of the testing department of the United States Forest Laboratory at Madison, Wis., on the subject of the strength of Western timbers, and by W. D. Starbird, of Portland, Ore., on "Log and Lumber Flumes."

Proper Care of Shade Trees

Count Up the Points Your Trees are Entitled to—Expert Instructions Simple to Follow.

By

Carl Bannwart, of the Newark Shade Tree Commission.

Examine your tree for points every month and see what percentage it will have out of a possible one hundred. Each of the following, if answered unequivocally, "Yes," gives your tree 8 1-3 per cent. toward the one hundred. These questions are put in order of their importance.

1. Is the opening around your tree of standard size? Standard size is: 4 feet square for a tree of 6 inches (or less) diameter; for every 1 inch increase of such (6-inch) diameter, an increase of 1 square foot in area of opening.

2. Is the ground in this opening well-loosened to admit air and water?

3. If the tree is surrounded by grass, is the sod open around the trunk?

4. Does the tree get a good proportion of the rain which falls on the sidewalk, or does the water run over the curb into the gutter?

5. Is the tree protected with a tree-guard? Guard must be six feet high and not too tight. Tree must be protected from chafing by guard.

6. Is the tree free from borers? Borers can be detected by sawdust coming out of holes in the trunk. Watch for the borers from April to November.

7. Are the trunk and the branches cleared of all cocoons, egg-masses, larvae, caterpillars, beetles, scale?

8. (a) Is the head free from all deadwood, has it been pruned by an expert, and how do you know he is an expert? Find out how a tree should be pruned. Are all the cuts painted? (b) Does the tree stand perpendicular and is its present place intended to be its permanent home?

9. Have the scars from horse bites or other injuries been cleaned out and painted to prevent harbouring insects and to stop decay? If there are large cavities these should be filled with cement.

10. Does the tree remain green and in full leaf to the middle of October?

11. Have you put as much nourishment into the soil as the tree needs for the year? Give it a treat; dig in wood ashes, ground bone or well-rotted manure.

12. Are any wires interfering with your tree either by swaying or by electric current? Are there any gas leaks?

"Here are twelve points of a good street tree. The total percentage if below par reflects on the man, not on the tree. The tree always does its best. Man forgets that he has taken it out of the God-made forest where it could and did care for itself, and has placed it in a man-made city where it is dependent on man's care for thrifty growth."

St. Maurice River Storage Dam

By

O. Lefebre,

Chief Engineer, The Quebec Streams Commission.

The St. Maurice river has a drainage area of 17,000 square miles. It takes its rise at a distance of about 360 miles north of Three Rivers. Its head waters are from numerous lakes whose elevation is about 1,300 feet above mean sea level.

The river is remarkable for its numerous falls and rapids,—two of which are fully developed and a third utilized only partially. Of the two developed, one is at Shawinigan with an available head of 150 feet and the other is at Grand Mère with a natural head of 40 feet, and a possible head of 75 feet to be available as soon as the dam, now being erected, is completed.

The flow of the St. Maurice river varies from 200,000 cubic feet per second during highest water, to 6,000 cubic feet per second at low water. The low water stages occur usually during August and September and the winter months, this being the cause of heavy losses by the industrial companies. It is proposed to remedy this condition by the storage of water in the upper part of the river.

In the summer of 1912, surveys were carried out and a dam site chosen immediately above the La Loutre falls at a distance of 240 miles, by the river, from Three Rivers, of 50 miles above the mouth of the Manouan river, a tributary of the St. Maurice, and about 40 miles due east of Parent Station on the Transcontinental.

This dam will store the waters from a drainage basin of 3,650 square miles. The water thus stored will be sufficient to regulate the minimum flow at Shawinigan to 12,000 cubic feet per second. It will decrease the power at Shawinigan, Grand-Mère and La Tuque by 67,000 horse-power-years.

The dam will be of the type known as gravity section, of cyclopean masonry. Its maximum section will be 80 feet above the bed of the river, 60 feet wide at the base and 20 feet wide at the top, the upstream face being vertical.

The water at the dam site will be raised 47 feet above the present low water. The area of the flooded lands will be 95 square miles, all Government property.

The crest of the dam will be about 1,700 feet long at elevation 1,335 above mean sea level. The weir is 840 feet long at elevation 1,325. The dam is provided with 10 bulton sluices 12 feet by 7½ feet wide and a log sluice. When the reservoir is full it will have a surface area of 300 square miles.

While the dam is being built for power purposes it will benefit largely the log driving operation on the river St. Maurice.

The storage dam is now under contract which calls for the work to be completed by the 1st of January, 1918. The Quebec Streams Commission, acting for the Quebec Government, has contracts with the Shawinigan Water & Power Company, the Laurentide Company and the Brown Corporation for the use of the storage water. The annual revenue from these contracts will leave a surplus after deduction is made for interest, sinking fund and maintenance.

Photo by J. C. B.

The hope of the future generation in the north. Indian girls at La Plouge Mission.

On a Winter Survey in North Saskatchewan

A Newsy Sketch of a Forest Engineer's Travels in a Land That Needs Protective Treatment.

The Commission of Conservation has made plans for an investigation of the forest resources of Canada. During the past three years, work along this line has been under way in British Columbia and Saskatchewan, in co-operation with the B. C. Forest Branch and the Dominion Forestry Branch, respectively, assisted by information secured from private concerns. In both provinces, the field work has been finished, and the reports are now in course of preparation, and will be published later.

In Saskatchewan, this work has been carried on by J. C. Blumer, who has recently made a trip, under winter conditions, into a portion of the North Country, concerning which but little information is available to the general public. On account of the very interesting character of the progress report made by Mr. Blumer, on his return from this trip, permission to publish the following extracts has been given.

Prince Albert, Sask.,
March 30, 1916.

Dear Mr. Leavitt:

The following is my final field report:

Taking advantage of the fine weather, I started for Lac la Ronge on February 19th, hiring Ranger

Lee with his team and bobsled for the purpose. We drove out to his place, 20 miles, during the evening. Loading hay and feed and outfit, we drove to Angling Lake the next day. At Shoal Creek we saw logs being loaded by means of "caterpillar" engine and sleighs on iced road. A large cut is being secured by the Prince Albert Lumber Company, despite the unfavorable winter.

Next day we drove fifty miles to Montreal Lake, arriving at 8 a.m. East of Waskesiu Lake a tract of land is nearing the prairie stage. It was formerly spruce forest. Something over a mile of very good Indian timber is passed through before reaching the lake. Their wasteful methods of cutting show that they need a forester to look after their holdings.

By request of Chief Fire Ranger Thompson, I looked up a site for a ranger station with Lee, who will be sub-chief for the coming season. We drove to the north end of the lake to-day, it was a very fine day, the temperature going from zero at sunrise to 40 above, but in the afternoon the snow softened and the horses went through at each step. A good view of the timber belt on the east of th elake was obtained.

Action Needed Here.

The horses here had to stand out wth five other teams, and we camped in a very small cabin with eight freighters, all sleeping on the floor, as usual. Snow fell during the night, and the next morning good weather was at an end. However, we had a start, and were across the lake. Facing the wind, which bothered in open places only, we made a noon fire in falling snow and reached Hoofer's cabin in the evening. A 30-mile stretch of 40-year-old timber here merits protection and should be included in a reserve before it burns down again. On the trail between Montreal Lake and Lac La Ronge there is less than one percent of spruce saw timber, and none of pine. The next day we crossed Pine River and Potato Lake and had a windy noon fire. The horses could not go faster than a walk, for at nearly every step they would sink into the deep snow beside the narrow road. We arrived at La La Ronge at dusk, putting up at the Hudson's Bay Company. Angus McKay, who is in charge, was seen here. The distance of practically 200 miles from Prince Albert was made in five days from time of starting. A wild gale blew on Lac la Ronge to-night, but it was almost warm, 32° above. . . . . .

Travelling by Cariole.

On Monday morning the mercury stood at 30°. I walked back to Revillon's, making preparation to start west by dog train next morning. That night it grew very cold, and in the morning, the last day of February, the instruments showed 53° below zero. The start was postponed till next morning. The glass still stood at 30, but at 10 a.m. we started with two sledges, 9 dogs, and a second driver. We made a run of one hour, the first of my experience in a cariole. The wind on Bigstone Lake was very cold. After crossing it, we had to wait half an hour for the second train to come up. When it arrived the kettle had to be boiled, after going about five miles. This was discouraging. In the next few miles the trail in the muskeg frequently became drifted full and progress was slow. The second train still lagged behind. The driver now said the journey could not be made in less than 8 days. For all I knew it would be 10 or 20 days. The snow was knee deep and more everywhere, except on the lakes. The trail was chiefly open muskeg, the driver said, which is the worst to drift. A cold night and camping out were certain. We turned and got back to Lac la Ronge that evening. I now regretted that I did not return with Lee. However, empty freight teams were likely any day to

be going to Prince Albert. The next morning a furious gale blew which continued all day, with temperature below zero. It was a real blizzard; one of the worst days of this severe winter. The Indians were as glad as I that we had turned back.

On the following day I made a round trip of 13 miles on foot, part of which gave me a very good cross-section of the types covering the Archean rocks which cover a great area in this part of the province. The timber is nearly all second growth, about 50-60 years, and slow in growth, as may be expected on granitic rocks.

. . . . . .

The Indian population tributary to Lac la Ronge and Stanley is given as 600 souls. There are probably a dozen white trappers in addition to the traders and the 3 or 4 fire rangers. The freight coming into the district this season is about 140 tons. The catch of fur is remunerative, that of foxes alone being around $10,000 for the present season.

The Comforts of Home.

After one or two more vexatious delays I made another start. The cold snap had continued all the week was broken. My second train of four dogs was now replaced by a better one of five. This made 10 dogs and 2 drivers, with an additional man to break trail. The wind was still cold on the lakes. At 10.30 a.m. we halted to boil the kettle. At noon on Nemeiben Lake, I met Inspectors Barker of the Hudson's Bay Co., and Cowper of Revillon Freres Co., travelling together with five men, 4 sledges and 17 dogs. They had come from Isle a la Crosse via Snake Lake, and our trail was now broken. Upon reaching Morning Lake in the evening I dispensed with my third man. He desired to accompany us without pay, to which I agreed. We had plenty of food at the time, which is apparently more consideration to an Indian than cash. Also, the young fellow wished to accompany his brother and see the country. He changed off with his brother, one running ahead all the time, and thus the dogs travelled better. We camped in an Indian house about 11 x 12 feet with no floor and were treated (?) to caribou meat. The Inspectors and their men had cooked and slept here with one Indian family of three the night before. This night another Indian family had arrived and eleven people, one more than the night before, comfortably (!) filled the floor.

Had it not been for fire, many millions of railroad ties would now be cut from forests like this. Fire prevention will secure them for the future. Near Snake Lake, Churchill River Basin.

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Poplar Replacing Birch.

During the evening very high wind prevailed and the northern lights covered nearly the entire heavens. In the morning at sunrise the temperature stood at 17° below

zero. We travelled across the remainder of Besnard Lake, crossed several other lakes and finally Snake Lake to the village here, located under unusually large birch and poplar. Behind the broad cobblestone beach of Snake Lake, we encountered some snow drifts 6 to 8 feet high. Otherwise the lakes were good travelling but somewhat rough and the 30 or more miles a day were easily made. Since leaving the Trout Lake village we had left the rocky country and the topography was lower and smoother with poplar replacing birch. Two hungry looking drivers and still hungrier dogs had attached themselves at Trout Lake village and travelled with our outfit to Snake Lake. We had started with sufficient dog feed to take us through but it was necessary to procure more feed here. The men had started from Lac la Ronge with 15 bannocks but at this point, not much over half way, had but one left. Feeding the population along the route can not well be avoided. Give an Indian a full supply for a week's trip, he will eat it up or give it away the first day or two and mayhap starve the remaining distance. From here on I handed out some of my reserve bannock, but the men got no fresh supply. I camped with one Indian family, the men with another.

. . . . . .

A Meal of Lynx.

The route now led overland through a succession of jack pine ridges and muskeg. With the lake the poplar and birch was left behind. The trail had fresh snow on it. Making the usual two stops during the day, we crossed Pine river on whose banks drifts wer epiled, and came to the first small lake in the evening. Here the leader got on a wrong trail. We made three extra miles, and camped out on this lake. The dogs were tired to-night. During the night some more snow fell, making the trail still heavier for the next day. The weather was mild. The trail scarcely wide enough for the cariole, wound its way through a great deal of very dense, snow-laden young growth. The trail in places being highest in the middle, it was hard to keep the balance and occasionally I tipped over. One was never sure of steering clear of trees at the turns. Keeping the time tally of types at the same time was rather a nerve-racking experience. At the forenoon stop a lynx taken from a trap made a large part of the meal. I cooked my own meals, the Indians theirs, but the lynx could not be resisted. It was good. Crossing several lakes and taking another lynx during the day, we emerged upon the estuary of Beaver River about 5 p.m. Making another "portage" we reached Isle a la Crosse Lake shortly, which had yet to be crossed. A storm had risen on the lake so that no land was in sight and it was getting dark. We were able to get some dog feed here so I decided to camp for the night at an Indian house though the men were willing to go on. Once more there were eleven of us.

Types of Timber.

The type of country from Snake Lake to Isle a la Crosse Lake was very different from that eastward. It lies south of the rocky belt and the water surface amounted to only 9 percent. A very good overland cross-section is obtained, for the few lakes and ridges are crossed at right angles to their long axis. With the exception of a few open muskegs, the whole distance of land is densely wooded with jack pine, birch, spruce and tamarac. But the timber is nearly all small. The jack pine of tie size makes up less than one percent of the distance. There is no other saw timber.

Having made the trip from Lac la Ronge in good shape, I wanted to go north to Cree Lake and return, covering at least a part of the journey I had previously planned. But

I was advised against it. I learned that for the first time in many years the reindeer had not arrived at Cree Lake, that people were starving, that fish for dog feed were not obtainable. One man had gone hunting leaving his family with a moose hide to eat. A trader had sent some dog trains with provisions but after six days travel, owing to the heavy snow, they were yet a long way from their goal and were obliged to cache their loads and return to Deep River for more dog feed. They then returned and brought their loads back never reaching Cree Lake. The trail for the first 100 miles or so from Isle a la Crosse led over the same route I had already covered last summer. This was, of course, a water route and there was no other return route. The season was getting late and typical March weather prevailed, storms succeeding thaws. On Monday morning a string of freight teams arrived returning to Big River immediately. So I reluctantly gave up the northern trip to return with the freighters. I settled with my men and bought them and their dogs a return allowance of feed.

From all I could gather the types of country and amounts of timber for the whole western part of the trans-Churchll region are essentially the same as in the Portage La Loche and Island Lake section secured last summer and the Isle a la Crosse,—Snake Lake setcion now obtained. It is in certain sections of the extreme northeast where there is apparently a close approach to the "Barren Lands."

(Sgd.) J. C. BLUMER.

Mr. Clyde Leavitt,
Forester, Commission of Conservation,
Ottawa, Ont.

An Entire Colony Needed.

In a report of an address given to the Women's Canadian Club of Hamilton, by the Secretary of the Canadian Forestry Association, one of the newspapers referred to the speaker's condemnation of Governmental laxity in building up a sound system of forest protection and the reporter concluded with this paragraph:

"As they left the hall, the members signed a petition to the government in favor of the establishment of colonies for the segregation of the feeble-minded."

J. R. Booth's Birthday

Mr. J. R. Booth, the veteran lumberman of Ottawa and Hull, has just celebrated his ninetieth birthday. Despite the fact that he is now twenty years past the allotted three score years and ten of the Psalmist, Mr. Booth continues to take a very active interest in all his company's interests. He was born in Shefford County, P.Q., and as a young man went to the United States, where he worked on railroads and in various lumbering camps. Ten years before Confederation he moved to what was then Bytown, a little lumbering village on the outskirts of civilization, and commenced in a very small way to manufacture lumber. Later he built the Canada Atlantic Railway between Ottawa and the United States border, in order to provide an outlet for his products. Today John R. Booth is the largest owner of timber limits in the Dominion, and one of the most extensive manufacturers of lumber, pulp and paper, and other wood products.

Forest Conservation as a War Measure

"Natural Resources Lie at the Foundation of all Preparedness Whether for Peace or for War."

By

Clyde Leavitt,

Forester, Commission of Conservation; Director, Canadian Forestry Association.

"Natural resources lie at the foundation of all preparedness, whether for peace or for war." These are the words of Gifford Pinchot, the foremost advocate on this continent of the better conservation of natural resources.

This statement by Mr. Pinchot is no less true for Canada than for any other country. Its truth is obvious, so far as the great world-war is concerned, since a moment's thought will demonstrate that behind the production of munitions and of all the multitudinous articles of equipment and supplies essential to warfare, there must be great supplies of the natural products of the earth. Of these, the metals and other minerals, and the various woods, come first to mind. All food supplies, including meats as well as grains and vegetables, are dependent upon the productive capacity of the soil, which is the most important of all natural resources, aside from human life itself.

Considering this latter element, human life, it is obvious also that the capacity of a country to sustain population must depend primarily upon either agriculture or manufacturing or both, and the extent to which these can be developed depends absolutely upon the extent of the natural resources available, of which the soil, the metals, the forests, and the water-powers are the most prominent examples.

In time of war, the financial credit of a country is a factor the importance of which can scarcely be overemphasized. The degree to which this can be realized upon depends to a very large extent on the degree of development of manufacturing industries. Since these, in turn, depend directly upon the extent of natural resources available, the connection between national credit and natural resources is obvious.

Thus we see clearly that natural resources are the determining factors, not only with regard to the production of munitions and supplies, and of credit, but of men as well, who constitute the most essential element in any programme of national defence.

Agitation a Necessity.

The relationship above outlined for war conditions is equally true in times of peace. Practically every form of human activity is directly or indirectly dependent, either immediately or ultimately, upon the utilization of some natural resource. All agriculture and all manufacture are directly so dependent, as has been shown. Only the boundless natural resources of Canada—her lands, her forests, her minerals, her water-

powers—have made it possible for her to attract so large a population from other countries, and with future possibilities in this direction which are as yet almost undreamed of by the average citizen.

These fundamental relationships are as yet realized only in small part by the great public-at-large, and that is the real reason why progress toward better methods of utilization is so slow. A vast amount of agitation is almost always necessary, as a preliminary to the adoption of reform measures, and this is as true of the conservation movement as of any other.

Contrary to the popular concept, conservation does not mean the present locking up of natural resources for the benefit of a distant future. On the contrary, it simply means the avoidance of all unnecessary waste; in other words, it means wise present use, with a view to making non-reproducible supplies, such as coal, iron, etc., last as long as possible, and to so using the reproductible resources, such as the forests, as to make them self-perpetuating.

Would Pay War Charges.

Everywhere, among the nations at war, the avoidance of all forms of waste is being strongly advocated as a war measure. One aspect of this broad movement, which is receiving less attention than it deserves, is the need for better conservation of our forest resources. It is estimated that the average annual loss by forest fires in Canada is sufficient to pay the interest upon the recent Dominion loan of $100,000,000.

The importance of the forest resource in the internal economy of the country is shown by the fact that the estimated total value of forest products for Canada in 1912 was $182,300,000, or an annual wealth production of $25.68 per head of population. In 1913, nearly eight million dollars was derived, by the Dominion and provincial governments, directly from the sale or lease of cutting rights to publicly-owned timber lands and from royalty and stumpage payments made upon timber so cut.

There are in Canada some 5,000 wood-using industries. The permanence of these industries depends directly upon the perpetuation of the forest resources of the country. It is perfectly obvious, for instance, that, no matter how large its timber limits may be, any large pulp mill must ultimately exhaust its resources of wood if the virgin forest be continuously drawn upon without adequate provision for its replacement on cut-over lands. Yet this is exactly the direction in which many concerns are heading. Pulp and paper mills represent very large investments of capital, and dividends are bound to fail in the course of time unless necessary provision is made for the perpetuation of the wood supply.

Better methods of protection from fire is the crying need of to-day, so far as the forestry situation is concerned. Great improvements have been made within the last few years, but the situation as a whole is still far from satisfactory.

"Mining" the Forests.

In actual practice, the forest has only too generally been treated like a mine, and gutted, with no thought of the future, rather than like a crop, whitch it really is. The ordinary method of unregulated lumbering followed by fire, as has only too generally been the practice in the past, is gradually but surely turning vast areas of non-agricultural land into a desert and non-productive condition. Timber is the only crop, aside from game and fur-bearing animals, which these lands are capable of producing. They are, however, capable of continuously adding very great wealth to the country, provided fire is kept out and other necessary measures adopted for the perpetuation of the forest as a forest.

The difficulty arises in securing practical realization of the fact that the forest is a crop, and that its utilization, on non-agricultural soils, should always be so regulated as to provide for the establishment of a new crop, and of successive crops, indefinitely.

This is particularly important as to the lands which have thus far received least consideration, namely, those which, because of their greater accessibility to transportation, have been logged off first. On such lands, stumpage values will always be higher than on lands less accessible, and it is therefore especially desirable, from every point of view, that the natural reproduction should be protected from fire and given an opportunity to reach maturity. Instead, the opposite has been the general tendency, and not only individuals, but the country as a whole must in the long run pay the penalty. To a far greater extent than is the case at present, we should be drawing upon interest, in the form of natural forest growth, rather than upon capital, stored up in the virgin forest. If this were done, our great forest resources could never be depleted.

The Menace of Brush.

Brush-disposal, as a fire-preventive measure, is a feature to which some attention has been given, particularly in the west, and some progress has been made. However, the lumber industry as a whole is still suffering from depression, and the general level of prices is still too low to permit general attention to the matter of brush disposal over the country as a whole. It is believed, however, that even at the present time, particularly in the east, it is practicable to a materially greater extent than is conceded by most operators. At least a beginning could be made, in many cases, by a more thorough clean-up of inflammable debris in the vicinity of settlements, camps, railways, wagon-roads, logging roads and streams, and along the edges of cutting areas. Such action would greatly reduce the danger of fires causing material damage, and would afford vantage points from which to control fires of accidental origin.

One of the most essential features of a forest-protective organization is adequate supervision over the fire-ranging staff. Taking the country as a whole, there is no question but that a very great deal of money is being wasted through failure to provide enough supervision, and of the right kind, to ensure that a dollar's worth of protection is secured for each dollar expended on the fire-ranging staff.

A Co-operative Model.

In this connection, the provincial governments of eastern Canada, and the great majority of limit-holders as well, should take careful note of the admirable results that have been secured by the St. Maurice and the Lower Ottawa Forest Protective Associations, and should profit by their example. These two Associations have been able to secure the best degree of protection against fire that is to be found over any large area anywhere in eastern Canada. These results have been secured by the adoption of a thoroughly business-like administration, of which close supervision at all points is considered as absolutely essential feature.

Beyond any doubt, also, the matter of securing a thoroughly competent personnel in the fire-ranging staff is of the utmost importance. It is hardly conceivable that any one should seriously question this. Yet, in no single government fire-ranging service in all of Canada, so far as is known, are the appointments of fire-rangers clearly and definitely based upon the one ideal of merit and fitness for the position. In every single one, Dominion as well as provincial, the patronage system holds the reins, and party advantage is, as

a rule, the primary consideration, with merit and fitness of the applicant secondary. Undoubtedly, many thoroughly competent men are appointed under the patronage system, but the exceptions are too numerous, and the tendency of such a system of appointment is far from being conducive to proper ideals of discipline and organization, and the development of a wholly efficient service. In this respect also, the St. Maurice and Lower Ottawa Associations are able to set a good example to the several governmental agencies. These Associations, being composed of limit-holders, are able to select their fire-ranging staffs upon the sole basis of merit, and actually do so. On any other basis, the really remarkable results secured would have been impossible to the same degree and at the same cost.

Patronage Patrolmen.

The general tendency of the patronage system was admirably expressed by Sir George Foster in connection with the recent debate upon the estimates of the Public Works Department. His remarks are, however, equally applicable to the several fire-protective services throughout the Dominion. In the discussion referred to, Sir George made the statement that in the whole course of his thirty-four years of public life, he could not point to a single instance where political patronage ever helped the status of the bench, ever helped the status of the Civil Service, ever helped in the economy of their administrations the status of public administrators, no matter what function they performed, never helped a member of Parliament in reality, and never helped a Government in reality.

In view of this strong statement and of the very general chorus of approval with which it met, it would seem that material progress has been made toward hastening the day when appointments to at least certain of the public services will be based upon merit rather than upon patronage. Certainly, such action would constitute one of the most effective means of reducing the tremendous forest fire loss sustained each year by this country. This action will not, however, be generally taken unless and until those directly and indirectly interested in securing better forest protection make their influence felt in a concrete way, in favor of this proposition. Not only are all lumbermen included in this category, both individually and collectively, but every citizen of every province as well.

Any action that will tend toward better forest conservation will be a step toward better preparedness, for peace as well as for war.

(The foregoing article also appears in the current number of The Canada Lumberman.)

Tile Walls as Snow Fences

Successful eperiments have been made in Iowa in the use of hollow tile for snow fences the results showing that such barriers will hold back about twice as much snow as the board fences. This barrier is made of six or seven layers of tile, the open ends forming the two faces of the wall, which is slightly serpentine to permit expansion. Wires are used for reinforcement. The tiles are molded in such a manner that air spaces extend through them at an angle of about 20°. The tiles are so laid that all the air passages lie in a plane parallel with the earth's surface but those of adjoining layers lie at opposing angles. When the wind passes through this fence, these diverging openings form conflicting strata of air which neutralizes each other's force so that it is compraatively calm at the leeward side of the shelter. This accounts for the large amount of snow that collects behind these

shelters, which will last longer than wooden ones, and in summer may prevent the spread of fires started by passing engines.—(Popular Mechanics Magazine.)

Cork Forests

The cork oak is a kind of jack at all trades among trees, and its service indicates well the kind of new freedom that trees may give us by their new helpfulness if we will just give them a chance. If the garden of Eden story had been written in Spain or Portugal I think the fortunate couple would have been placde in possession of a cork forest. If a man in either of these countries has a forest of good cork trees you will find him in Madrid, Lisbon or Paris. His cork forest works for him, and he stays in town.

Cork trees grow on the rockiest and poorest land. The poorer the land the finer the quality of the cork. Every eight or ten years the outer bark is stripped from the trees to furnish the ever more highly prized cork of commerce. By dividing the land up into blocks this decennial harvest will produce a fairly regular income.

These same oak trees produce acorns, often heavily, which are sold to some farmer, who drives his herds of lean hogs into the forest, where they harvest the acorns and turn them into salable meat. A Portuguese hog is expected to gain two pounds a day for ninety days when acorns are ripe.

More than this, there is beneath the oak trees some herbage fit for goats to eat. Thus the cork forest owner in Lisbon gets income from three contractors—the cork stripper, the pork raiser and the goat raiser. And with care the forest lasts forever. The individual cork tree is good for a hundred years or more, after which it is a fine big salable tree, with enough young ones near it to take its place when it is gone to market. In Portugal a cork tree, ready for its third stripping, is considered worth $25. When in full bearing an acre of these oaks will yield from one to three tons of cork, at a stripping, now worth about $70 a ton to the grower. Most of this is profit. The pork is profit. It is the common rule that the income from the pasture pays the small cost of caring for the forest.—J. Russell Smith in Country Gentleman.

Canada's Timber Needed

London.—There is at present a shortage of 400,000 cottages in England. Besides this shortage, there are old and unsanitary areas that ought to be cleared away. The building of these new cottages with a view to providing discharged soldiers with work after the war and removing a cause of emigration is the subject of a general scheme devised by the National Housing and Town Planning Council. It also forms another instance of the way the war has dissipated England's indifference to her internal problems.

One of the main causes of complaint among lease-hold farmers and farm hands is the poor housing. Ancient cottages with the lower floor flush with the ground and the roof thatched with straw may be picturesque, but they are damp and a main cause of the rheumatism from which the country people suffer so much. Of the 400,000 cottages, about 120,000 are needed in the rural districts. Families are now cramped into small quarters, living in old and mouldy homes or new and cheaply built affairs thot have no modern ideas or improvements.

The provision of homesteads with small holdings and the intensive cultivation of the soil, reforesting, the reclamation of wastes, the settlement of disabled soldiers and sailors on the soil and town planning schemes involving new main roads, playgrounds and open spaces, are a part of the programme of the housing council.

The Russian Forests After the War

Will Germany and Austria be Able to Command the European Market for Timber?

[An extract from "The Forests of Russia and Their Present Importance to the Allies," by E. P. Stebbing in "The Nineteenth Century and After," March, 1916.]

"Previous to the war, Great Britain bought nearly half of the timber exports from all countries, and her voice in the timber markets of the world was supreme. Will this be so at the close of the war? It is difficult to see that it can be, for the simple reason that we shall have other European nations competing against us in these markets, and those nations will be principally some of our present Allies. The devastation in Belgium, in North France, in Poland, and elsewhere will require an enormous amount of building and other timber to make good. These countries therefore, previously but small importers of timber since they depended mainly on their own woods, will have to purchase in the open market. In Belgium not only will building operations have to be carried out on a large scale, but immense destruction has been caused to the forests of the country, and the Germans have added to this by felling areas of woods wholesale and transporting the material inot their own country. The wondrous system and marvelous organizing powers of the Germans make the reason of this procedure fairly obvious. Not only are they thus restricting fellings in their own magnificently managed woods, which fellings *du reste* are naturally restricted owing to the want of labour; but we may assume that they have already correctly guaged the position, and that they are, in all probability, in preparation for the great demand for timber which they foresee must be the outcome of the present destruction, storing up the material so removed in depots for future use.

The Germans in Control.

Germany and Austria sent us small amounts only of forestry products, timber, etc., in the past. They own immense tracts of forest. It is scarcely too much to say that, without care, at the close of the war they will have the timber market at their mercy, and with the Allies competing against one another in this market they will be able to force up prices to an unprecedented level. Nor can we reasonably expect Norway and Sweden an dother countries not to take advantage of such a golden opportunity. It will be contended that our Colonies will come to the rescue. Doubtless, but for the most part this will not bring down or keep down prices owing to the extra freight on the materials imported. For it must be remembered that most of the easily accessible timber of the world—i.e., that growing alongside rivers and streams, and therefore transportable by water—has been cut and utilized.

Russia's Position.

We come back to the point then. What will be Russia's position and what her action? With her enormous forest resources it should be possible for her to throw a consider-

able—in fact a decisive—influence into the scale, and that this influence should be exerted in the right manner and at the right moment is for us, and in fact for our Allies, a most important factor. Once this point is fully realized it should be possible for the Allies to come to an agreement having for its aim two chief objects:

(a) To prevent the Allies competing in the open market against one another at the close of the war.

(b) To prevent Germany and Austria from being able to form a "corner" in forestry material and so send up the prices to a prohibitive extent to their own mutual benefit as the outcome of a war made by themselves.

We should face the fact that we, more than any of our Allies, except Belgium, are most concerned with this matter. They have forest resources more or less large at their backs in the shape of the woods untouched by the war, which have been planted and grown for commercial purposes. We in these islands have no such resources with which to influence the market prices or with which to help us tide over the dangerous period. It rests therefore with us to make efforts to safeguard our position in this respect at the close of the war."

Waste in Settlement

(From Cochrane, Ont., "Claybelt Weekly.)

"Save materials from waste"—"spend money wisely" in these two sentences really lies the ultimate success of our efforts to promote production and to exercise thrift.

"Save materials from waste" is an admonition specially adaptable to Northern Ontario. In the abundance of Nature's bountiful gifts, we not only just throw aside what for the moment appears useless to us because we fail to realize its latent values, but we go further and wantonly destroy. For the sake of cleaning a few acres we burn down miles and miles of virgin forests; we ross our pulpwood and simply burn the bark and shavings when not only possibly but very probably, the bark and shavings could be made to yield an abundance of valuable by-products; we grow the grain and then burn the straw, irrespective of feed and other value; we build up the nucleus of prospective prosperous towns along the new railways and allow bush fires to sweep them off the map in a few hours; and so it goes on ad infinitum. In a mad haste to transform the primeval forest into farms in the shortest possible period, we waste considerable more than the farms can produce for years to come. The arguments brought forth in favor of such ruthless destruction are plentiful but they all are fallacious because they are based on and spring from ignorance which makes it so much harder to combat. If you cannot use a thing yourself burn it—is a pitifully crude way of disposal."

According to the casualty lists, Eric G. MacDougall, of the B. C. Forest Service has been wounded in battle.

The Power of a Dollar

The Association's plans for an extensive publicity campaign in all parts of Canada can be realized only by the prompt remittance of the 1916 membership fees.

The revenues are most limited at best, and the contributions of the members mean the carrying out or abandoning of urgent educational work.

If you have not remitted the dollar fee, try to do so on receipt of this issue of the Journal.

Published in collaboration with the Canadian Society of Forest Engineers.

Messrs. D. A. Macdonald and C. H. Morse, of the Dominion Forest Service, have been elected Associate Members of the Canadian Society of Forest Engineers.

Mr. E. H. Roberts, Acting Inspector for Saskatchewan, of the Dominion Forest Service, reports that the fire season is beginning later than last year and the outlook is more favorable due to considerable rain and snow flurries every few days. A new patrol boat has been placed on the Saskatchewan River between Prince Albert and Cumberland House. The sub-chief fire-ranger in the Montreal Lake country is trying out an "Aerothrust" engine attached to his canoe from which he expects big things. One forest survey in charge of Student-Assistant G. A. Mulloy, assisted by A. W. McCallum, left Prince Albert to examine the territory north of the Fort a la Corne Forest Reserve about the first of May, and will be followed by another party about June first. A reconnaissance party will spend the summer in the interior of the Porcupine Forest Reserve. Three new eighty foot steel look-out towers are being erected to supplement the nine already up and extensive telephone construction work is being undertaken on the various reserves.

A plantation of some fifteen thousand white and Norway spruce, Scotch pine, European Larch, lodgepole pine and jack pine has been established on the Pines Forest Reserve from stock grown in the Reserve nursery. Small experimental plantations of a few acres are being set out in the Elbow, Dundurn and Manito Reserves from stock grown at the Indian Head Nursery Station and under the supervision of one of their staff.

Mr. J. C. Blumer, of the Conservation Commission completed a very interesting winter trip with dogs and Indian Guides through the northern part of the Province during the month of March. He passed by way of Montreal Lake, Lac la Ronge, Ile a la Crosse and Big River.

Interesting developments are taking place in the Beaver Lake gold fields, numerous prospectors are going into the country this spring and also into the country to the northeast. It is reported that considerable eastern capital is coming in and much work will be done this season.

Mr. G. A. Gutches paid a short visit to Prince Albert last month and expects to return again in the summer or fall.

Coast Lumbermen Give Freely

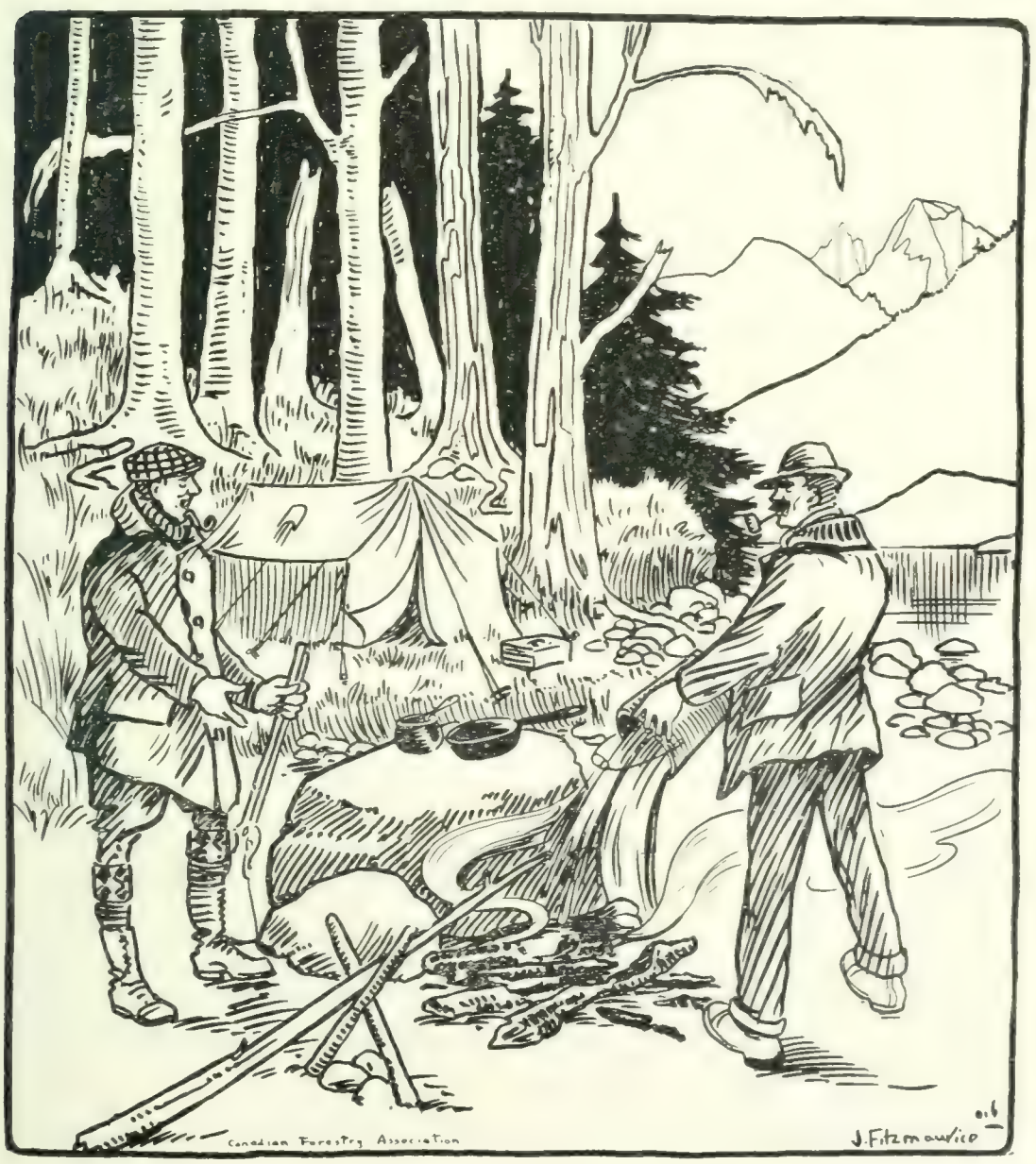
At a meeting of the Mountain Lumber Manufacturers' Association recently held at Calgary, Alta., it was decided that all members of the association should contribute 50 per cent. of their net profits to the Federal Government for patriotic purposes. Another resolution that was

passed was that the lumber manufacturers collect $1 per head a month from each unmarried employee for patriotic purposes. A delegation was appointed to attend the annual meeting of the Pacific Coast Manufacturers' Association and urge them to adopt similar steps. Various plans for enlarging the market for British Columbia lumber were also discussed.

Planting Trees

Over 1,000 acres of land purchased by the Massachusetts Forest Commission will be planted this spring to white pines and other conifers. During the next few weeks state nurseries in Amherst and Barnstable will send 1,000,000 small trees to portions of the state selected for reforestation.

FROM THE ASSOCIATION'S FREE CARTOON SERVICE NOW USED BY OVER 300 CANADIAN NEWSPAPERS.



The Amateur Camper: "You certainly take a lot of trouble to put out a camp fire!"

The Guide: "Better to take the trouble now than burn down ten miles of camping sites. Only a greenhorn nowadays fools with fire in a forest."

The Forest Pleaders

E. T. Allen, forester of the Western Forestry & Conservation Association, Portland, has sent the following recitation for six pupils to schools in Oregon and Washington for use in Arbor Day exercises:

First pupil, carrying evergreen branch:

I AM THE FOREST.

I clothe this Western land
With beauty and on every hand
You turn to me in daily need.
Your best friend I have always stood;
You could not live not using wood.
For your protection now I plead.
Nor do I bid you take my word;
Let these, my witnesses, be heard.

Second pupil, carrying pail of water:

I AM THE STREAM.

From my woodland springs
To river mouth where the white gull wings
Over the ships from the ends of the earth,
I flow to your homes and mills and fields,
And carry the freight that the harvest yields,
But shady forests gave me birth.

Third pupil, carrying pet animal:

I AM THE WILD THINGS.

I speak for graceful deer,
And flashing trout in brook pools clear,
For singing birds and squirrels pert,
And all the wearers of feather and fur.
What should we do if no forest were
To shelter us from fear and hurt?

Fourth pupil, carrying ax:

I AM INDUSTRY.

To me the forest brings
Reward for labor and all things
That money buys, for in this state
Over half our wage-earners' pay
Comes from lumbering in some way.
The fate of forests is my fate.

Fifth pupil, carrying fishing-rod:

I AM PLEASURE.

Happy vacation days,
Camping, hunting, and all the ways
Of nature in her gladdest moods,
The forest holds for girls and boys
Who love out-doors and wholesome joys—
There is no playground like the woods.

Sixth pupil, strikes match and holds it burning:

I AM THE FUTURE.

Shall all these pass away?
Must we look forward to a day
Of fire-charred, lifeless, streamless slopes,
Where thoughtless match or unwatched brand
From man's ungrateful, careless hand
Has destroyed his own children's hopes?

All, Future blowing match out, watch as he drops it, then tramps it out:

FIRE IS OUR ENEMY.

Won't you help us, then?
Learn yourselves, and teach all men,
This, the lesson all must learn:
Put out the campfire and the match;
Careful with slash and clearing-patch;
Leave no fires in the woods to burn.

Benefits of Organization in Forest Protection

Northern Protective Association Suffered Small Losses in 98 Fires —The use of Modern Publicity.

The failure of recent efforts to bring together those interested in a mutual forest protective association in the Upper Ottawa region, can be regarded as merely a temporary shelving of a plan that the near future will see realized. Reports just received regarding the past season's success of the Northern Forest Protective Association of Michigan prove once more the potency of organization and skill in limiting the damage done by forest fires. The American association works on much the same lines as the Lower Ottawa and St. Maurice associations of Quebec which have been doing excellent work on an area equal to one-third of the total forest area of the province.

"The fifth annual meeting of the Northern Forest Protective Association was held at Marquette, Mich., on Tuesday, the 7th of March.

The Protective Association has become fully established in the Upper Peninsula and its work for the past five years has become widely known through its success in limiting the forest fire menace.

Ninety-eight Fires Per Year.

The records of the Association for the past year ending March 1st, 1916, show a total of 98 fires, covering an acreage of 13,090, with a loss of $8,746.30.

In addition to the fires reported, there were a number of incipient fires on unlisted lands which the wardens put out without making a detailed report thereof; fires which caused no damage whatsoever.

The causes of the fires were as follows:

Settlers, including one contractor clearing land for settler	19	20%
Locomotives	19	20%
Steam loaders	1	1%
Campers	5	5%
Unclassified—thought to be settlers	4	4%
Fishermen	4	4%
Pedestrians	3	3%
Road crews	2	2%
Wood choppers	1	1%
Farmers	3	3%
Logging employees	1	1%
Sugar makers	1	1%
Smokers	2	2%
Stove pipe	1	1%
Tramps	1	1%
Sportsmen	1	1%
Unknown	30	30%

From which it will be noted that the percentage of unknown causes retains its position at approximately 30 per cent., while fires originating from settlers clearing land and from locomotives balance each other at approximately 20 per cent.

There is a constant decrease in the number of fires traceable to campers, fishermen, sportsmen and other woods travelers, which is conclusive proof of the fact that the publicity campaign, which has been the key-note of the Association since its inception, has borne fruit. It is proof also that greater efforts must be made to reduce the number

of fires caused by settlers and by locomotives; and the co-operation which the railroads have given during the past season and the interest displayed in better equipped locomotive stacks is evidence that fires from this source will annually decrease in numbers.

The Benefit of Patrol.

The number of fires on lands listed with the Association numbers but 36, while the balance, 62, occurred on lands not listed for patrol, but which, having occurred, were taken care of by the wardens. The acreage burned over on membership lands totals 4,904, and that of the non-listed lands, 8,186; while the losses to the membership total $7,064.17 as against $1,682.13. These figures present an interesting illustration inasmuch as the non-listed lands—although in many cases belonging to members of the Association—are composed largely of plains and slashings, the very localities where fires are most apt to occur. Fires occurring in such locations naturally travel more rapidly owing to the influence of wind, and consequently burn a greater area, with losses very much less, due to the fact, of course, that there is little of value to be destroyed.

Publicity Features.

The publicity features, which have brought so much attention to the Protective Association in years past, have been used and added to in several ways, among the most important being the publication of the report of the annual meeting of 1915 in booklet form, largely as a text book on spark arresting devices; the posting of notices of new design, the distribution of several thousand pamphlets of the Game & Fish laws with proper forest fire notices, and the preparation of a course of ten lectures on Forest Fire Prevention to be issued to a mailing list of practically one thousand woodsmen.

The Secretary-Forester advocated the addition of a number of cars for Association service and showed by comparison with other places the feasibility and economy of such a course.

Equipment of Forestry Battalion

When the 224th Overseas Battalion paraded recently in Ottawa, for inspection by his Royal Highness the Governor-General, the equipment carried by the members of the battalion created considerable discussion among lumbermen in Ottawa and elsewhere. We have heard several lumbermen discussing this matter and in order to explain the affair we have made enquiry of the Officer Commanding. It will be recalled that, upon that occasion, the Forestry Battalion paraded with various implements, among which were broad-axes. As broad-axes are used for squaring timber, and as the Forestry Battalion will probably be employed chiefly in the felling of timber and have little or no squaring to do, there was some criticism about this equipment, a few lumbermen going so far as to intimate that the carrying of broad-axes laid the battalion open to ridicule.

The officer commanding, referring to this subject, says:—"Your information as to part of the implements which our battalion carried during this parade is quite correct, but they carried also peavies, camp-dogs, cross-cut saws, etc. This parade was not intended to show what implements they should carry, but merely for inspection by his Royal Highness the Governor-General. Our equipment altogether will be that used in the lumber industry in Canada and therefore, this parade cannot be taken as affording any example of the equipment we will carry abroad."

The 224th Forestry Battalion has made quite a record in recruiting, having, in about one month secured some 1,800 men.—(Canada Lumberman.)

The Secretary's Page!

Attention, Game Clubs!

The Secretary of the Canadian Forestry Association, Booth Building, Ottawa, has been in communication with several of the larger game clubs, and tourist organizations with a view of encouraging co-operation in the matter of forest protection. He has a special proposition to submit to the members of all such bodies and would be obliged for the names and addresses of secretaries.

Free Public Lectures

The Secretary in the month of April gave illustrated lectures to large audiences in public halls of Brockville, Marmora, Sault Ste. Marie, Prescott, and Hamilton. The lectures were accompanied by quite extensive newspaper publicity and the cause of forest protection thereby aroused valuable local attention.

In Our Mail Bag

"I wish to thank you for the copies of the Boy Scout Forest-Book which you sent to me to use in the classes in my school. We have had some very pleasant half hours together reading and speaking, discussing, etc., already, and expect to have more. It is such a beautiful book, so instructive and so suggestive that I wish it could be in the library of every school in the province."—Chas. G. Fraser, Principal of Manning Ave. School, Toronto.

"I can more than emphasize the education usefulness of the Association. I endorse it in the largest way."—J. L. Englehart, Chairman, the Temiskaming and Northern Ontario Railway Commission.

"We think your booklet the best thing we have seen so far on the subject of conservation."—Philadelphia Headquarters of the Boy Scouts of America.

"The education of our children in the beauty and value of our timber, trees and forests has been actively carried on by the Canadian Forestry Association. Twenty of their booklets have been distributed in the schools of Lillooet and twenty more to the older boys. The information contained is both entertaining and instructive."—Lillooet, B. C. 'Prospector.'

The Door of Opportunity.

Of scores of letters received by the Secretary of the Association asking for new supplies of publications on forest topics, the following is typical:

Hazleton, British Columbia,
May 5, 1916.

"We were greatly impressed with the Association's last booklet and with the idea.

"Passing it along to the school-teacher was the source of many inquiries from the kiddies themselves. Thus realizing the amount of interest that one copy created, we are under the impression that if you could favor us with a half dozen or dozen copies, the interest would be increased in an almost relative proportion."

The Association's very limited funds cover the widest possible educational field. **Every dollar** of the membership fees is required to keep pace with opportunities for good service. **Have you sent in your 1916 fee yet?**

B. C. Fire Prospects

Victoria, B.C.—Advices to the Minister of Lands from the Southern Interior of the Province mark the beginning of the fire season, small fires being reported from the Cranbrook, Nelson and Vernon forest districts. In the first-named district the late spring is retarding the growth of vegetation so essential as a check upon fires running along the ground and burning the carpet of pine needles, twgs, dry leaves, etc. A hot and dry wind from the south is drying up the vegetation in the Okanagan and Similkameen districts, while hot weather prevails throughout the Vernon district generally. Farmers and settlers are reminded that permits are required for all fires set from the beginning of May, for which application should be made to the local fire wardens. Campers, sportsmen and travellers are urged to exercise every care in extinguishing camp fires, and the co-operation of all sections of the community is desired, in order that damage to property may be avoided. It is worthy of mention that in 1915 305 fires out of a total of 1,031 outbreaks, were traced to campers and travellers; while 267 were caused by land-clearing operations. Damage by fires to the timber in 1915 amounted to $109,000, and other property, viz., logging equipment, farm houses and buildings, etc., $58,000. The majority of all fires in 1915 were, as usual, due to human agency, and were, therefore, preventable. Particularly this season, when the Empire is engaged in a vast and wealth-destroying war on a scale hitherto unthought of, it is the duty of every citizen to assist in preserving our resources from avoidable destruction.

Fewer Forest Fires in U.S.

The damage done by forest fires on the national forests of the United States in 1915 was much less than the average for the past five years, according to official figures just compiled. This is in spite of the fact that the season was an unusually dry and hazardous one.

Of the total of 6,329 fires only 346 did damage to the amount of $100 or more. The average damage done by each fire was kept down to $60.41, which was less than the average for the past five years. The average cost of fighting each fire was lowered almost $21 below the average for the past five years.

Fire on the national forests in 1915 destroyed $190,000 worth of mature timbed. The damage to young growth, forage and stream flow cannot be calculated but was much greater.

Among the causes of these fires, lightning as usual holds first place, with 28½ per cent. The carelessness of campers, responsible for more than 1100 forest fires, comes second. In California, however, fires caused by campers heads the list, with a percentage of almost 25 per cent. of the fires in the State; lightning comes second with almost 20 per cent.

The railroads were responsible for only 9 per cent. Sawmills and logging operations caused less than 3 per cent., and the causes of 15 per cent. are unknown. Nearly 11 per cent. of the total were of incendiary origin.

Forestry Farms

"Saskatchewan requires more Forestry Farms. Then there would be at least two lectures continuously on the road to hold meetings, giving lectures on forestry, shelterbelts, etc. The gospel of tree-planting should be brought to farmers. These lectures could take the names and locations of farmers who are anxious and ready to plant trees, send in the lists to the head office in the province, and inspectors should be sent out to examine each farm, so as to advise farmers where

to plant, and how to prepare the ground for the following year's planting. It is all right to expend money on the general Conservation Commission to enthuse citizens the Dominion over on what our natural resources are and how they should be conserved, but the practical working end of the problem should not be neglected. Give Saskatchewan forestry farms and practical men to meet progressive farmers, and in a few years the treeless, wind-swept prairies would be changed to a park-like country, with trees on every farm."—Saskatchewan Farmer.

Does Skilled Protection Pay?

During 1915 there were 1,031 forest fires reported by the Forest Fire Protection Staff of British Columbia. Of these, only 317 were classified as "cost fires." This is a considerable reduction as compared with the previous season when there were 639 "cost fires." The average cost of each "cost fire" was $61, whereas in 1914 the average cost was $219. About two-thirds of all fires originated on privately owned lands not classed as timber lands. The most prolific source of forest fires was carelessness by campers and travellers which accounted for 305 fires, or 29.6 per cent. of the total. 160 fires, or 15.5 per cent. are classified as of "unknown cause." Brush-burning accounted for 267 fires or 29.9 per cent. Railway operations were responsible for only 82 fires or 7.9 per cent. Lightning started 100 fires or 9.7 per cent. Railway construction was responsible for 17 fires or 1.7 per cent. 28 fires are classified as of incendiary origin being 2.7 per cent. of the total. Forest fires during the year covered an area of 30,310 acres as compared with 42,549 acres during 1914. They destroyed 144,220,000 feet of timber as compared with 102,804,000 feet B. M. during 1914. The damage during 1915 is estimated at $88,043, as compared with $52,852 during 1914.

Origin of Wood Pulp Paper

A writer in the "Newcastle Chronicle" says that an old hornet's nest caused Dr. Hill, of Augusta, Maine, to make the discovery. A friend and neighbor had told him there was not enough cotton and rags in the world to supply the newspapers and other publications with their raw material. That was about forty years ago, and Dr. Hill took a hornet's nest to the superintendent of a nearby paper factory and asked him, "Why can't you make paper like that?" They sat down together, took the nest apart, analysed it carefully, and decided that if a hornet could make paper out of wood, man ought to be able to do as much. The doctor discovered that the hornet first chewed the wood into a fine pulp. They decided to make machinery and water do what the hornet's mouth did. Such was the beginning of the wood pulp industry.

Spring Fires

Midwinter is the most dangerous time in regard to fires in buildings but so far as our forests are concerned, spring is one of the worst times. The dead leaves of last season and the dead twigs and branches on the ground are more brittle and dry in the first few days of spring just after the snow leaves than at any other time in the year. Those who go into the woods for any purpose are, therefore, cautioned to be careful with their camp fires and with matches. They should also see that any cigar or cigarette stubs are dead out before they throw them away. Observance of these precautions will do more for conservation than many meetings and conventions ten years from now and this duty is urged on all patriotic citizens. The fact that Canada is at war makes this duty all the more important.— (Publicity Bulletin of Dominion Forestry Branch.)

New Brunswick's Forest Survey

The sensible determination of the New Brunswick Government to have a definite survey of the timber resources of the province is given an interesting testimony in the 1915 returns of the quantity of lumber cut.

In 1905 the total was 107,705,676 superficial feet. This increased gradually until it reached 149,510,471 feet in 1907. During 1909 it jumped to 205,761,583 feet, and in 1910 made a still greater gain, reaching 281,-716,402 feet. During the following year, 1911, the high level was reached for the ten year period from 1905 to 1915, viz., 309,883,428 feet. During 1912-13-14 the amount declined, reaching 270,221,155 feet in 1913. Then in 1915, on account of the demand arising out of the war, it increased again and reached 290,120,-823 feet.

The latter figure is said to be a little in excess of the estimated annual growth on the Crown Lands of the province. Mr. P. Z. Caverhill, late of the British Columbia Forest Service, has been placed in charge of the survey work and will probably have three or four field parties out this summer, comprising thirty or forty men. The number of field parties will gradually be increased to eight or ten and the whole work will probably occupy from four to five years.

The revenue to the Government from the lumber industry for the year ending October 31, 1915, was the largest on record:

From the Canada Lumberman.

"Under these conditions it becomes imperative for the province to undertake a definite survey of its timber resources, so that its cutting policy may be directed along safe lines. Because the quantity cut may be the same as the quantity shown to be the annual growth, does not mean that the forests are being cut in a safe manner. The important thing is to make sure that the proper trees are being cut, those which are mature and those which, being cut, will give others a better opportunity to reach maturity. The indiscriminate cutting of small logs is a mistake, so far as the welfare of the forests is concerned, and the government of New Brunswick must pay special attention, under the conditions which exist to-day, to the proper regulation of cutting, so as to get the best results out of the forests and at the same time give reasonable encouragement to the lumber industry."

The Use of W oodFlour

More than twenty thousand tons of wood flour, valued at $300,000 are used annually in the United States in two widely different industries, the manufacture of dynamite and the manufacture of inlaid linoleum.

Wood flour is also used in making composition flooring, oat-meal paper, and in several other industries. It forms one of the means by which the huge waste product of our lumber mills is beginning to find some better means of disposal than the burner. Since a total of 36,000,000 cords of such waste is produced each year at sawmills, in the United States, of which about one-half goes into the furnace as fuel, while the rest is burned as refuse to get rid of it, there is no lack of raw material for industries which can develop ways of burning this waste to account.

All wood flour-using industries require a white or very light cream-colored flour having good absorptive powers. The wood species that may be used are confined to the light, non-resinous conifers, and poplar are the species most used. Mill waste, free from bark, furnishes much of the raw material for making wood flour.

Government Railways and Proper Patrol

In the following extracts from Hansard, readers of the Journal will recognize the difficulties facing the limit holders of Quebec Province in securing that co-operation from the Government railways which is freely accorded by the private-owned systems. The strange anomaly of Government-owned roads balking the cause of forest protection in a region where their future freights will depend almost entirely on the products of the forest is difficult for the average reader to comprehend. Hon. Jacques Bureau brought up the question of maintaining a proper patrol on the lines of the Transcontinental through the limits included in the St. Maurice Forest Protective Association, and the sharing of the expense by the Dominion Government.

[Extract from "Hansard" for April 5, 1916. (Page 2699.)]

"Mr. Bureau:

There is another matter that I desire to bring to the attention of the minister in connection with that part of the Transcontinental railway. The St. Maurice lumbermen have formed an association known as the St. Maurice Forest Protective Association, which has for its object the preventing of forest fires. They have built telephone lines and towers; they have fire-rangers, and they do all in their power to protect the forests in that region from fire. I understand that they have been corresponding with the Minister of Railways, and that they have never been able to get any satisfaction, some of their letters remaining unanswered. The correspondence had the object of requesting the Department of Railways to co-operate with the lumbermen in protecting the forests by keeping the right of way of the Transcontinental clean and by taking such action as might be necessary for the protection of the forests. I should like to know if it is the intention of the acting minister to defer action in this matter until the minister returns, or if instructions are to be given with a view to arriving at an understanding between the Government and the St. Maurice Forest Protective Association is the matter of protecting their limits from fires started by the Transcontinental railway?

Government Road to Blame.

"I understand from the secretary of the association that in the St. Maurice region last year the greatest cause of loss was fires set by the Transcontinental. I do not think it is right that the Government should not pay its share to help along this association in its work of protecting the forests. If the railway does not haul timber in that part of its line I do not know what it will haul, as it is a mountainous region where there are no other products.

"Mr. Reid (Acting Minister of Railways and Canals): The case of the St. Maurice Fire Protective Association has been brought before me. This association have limits along the line of the railway, and it is their custom to maintain a large staff of employees to protect their forests from fire. They receive some assistance from the Quebec Government. They want us to contribute $3,500 or $4,000 per annum towards the protection of their limits. I have not gone into the matter fully, but the thought that cmae into my mind is that between Win-

nipeg and Moncton, on the Transcontinental, there are a great many miles of forest owned by other parties, and if we pay the St. Maurice Association $4,000 to protect their limits we will have to do the same thing over the entire line from Winnipeg to Moncton. Of course, we know that all of the railways now maintain tank cars, which are filled with water and kept at convenient points along the road, so that in the event of a fire one of these cars can be brought to the spot within a short time and the fire can be extinguished. That system is working well. Everything should be done by the railway, but it struck me that it was hardly fair for a private company owing limits along the railway to say: we are going to maintain our own men to watch our own limits, but we want you to pay a portion of the expense. The matter came before me during Mr. Cochrane's absence, and that is the position I took. I referred it to the management at Moncton to get their opinion as to what should be done, and also suggested that whatever was done would have to apply to the whole system; there must be one policy throughout the system.

The True Position.

"Mr. Bureau: From the minister's statement one would believe that the St. Maurice Protective Association was going begging for the $3,500 from the Government. That is not the fact. The fact is that the Transcontinental Railway Company, like other railway companies, under the law is obliged to keep its right of way clear to prevent forest fires. The Transcontinental railway does not do it. It is complained that the Transcontinental railway, through the neglect of its officers, was exposing the forest to be burned. Fires did catch from the engines, owing to the lack of proper precautions, and these fires cost the association from $3,500 to $4,000. They ask the Government to recoup them the money they have been obliged to expend owing to the negligence of the Government. That is not a question of policy, but a question of fair dealing as between man and man.

A Promise of Reform.

"Mr. Reid: I did not understand that there was any claim. I thought the representations were with reference to future operations. There is no doubt at all that if the management is not doing its duty in protecting that part of the road as the law requires, and as it is protected in other parts, I will bring it to the attention of the management and see that whatever is necessary to put the Transcontinental in exactly the same position as other roads, so far as protection is concerned, is done.

The Cover Picture

The photograph reproduced on the cover of the Journal this month was taken on the Nelson River, Canada, and shows a group of fire rangers.

From HON. JULES ALLARD, Minister of Lands and Forests, Quebec, May 2, 1916: "I have no hesitation whatever to state that the Canadian Forestry Association has rendered the greatest services to the country and that the work it has done has contributed in a great measure to a more judicious operation of our forests and to the adoption of more efficient means to secure their conservation. It performs a work of very great value which deserves the encouragement of our population."

On the Field of Honor

The following forms a very graphic description of the death in battle of Lance-Corporal D. N. Trapnell, who was attached to the Forest Products Laboratories at McGill as assistant. He enlisted in 1914 and was reported missing after the battle of St. Julien. No more definite word was heard of him until the following letter was sent on by his father. It was written by a Chicago friend of Mr. Trapnell to his sister in St. Johns:

"One of the boys in our department invited me to go out to his club and listen to Mr. Philip Sampson speak on his war experiences in France; I accepted the invitation, and to-night found me at the club. Mr. Sampson's talk was very interesting indeed. After the affair was over, I walked toward his home with him. I happened to mention I was a Canadian and inquired of him whether or not he knew any McGill boys. He said, "Do you remember me talking about my two soldier friends who were killed at the same time I was wounded?" "Yes," I said, "Well," he added, "one of those chaps was a McGill man." "What was his name I asked?" "Don Trapnell," he replied. Well you could have knocked me over with a feather, I was so surprised.

To think that I should meet a man who knew Don and was with him at his death made me feel sure that "truth is stranger than fiction."

Sampson was the last man who saw him alive, and therefore I thought that perhaps his people might like to know about it. On the other hand, it may open an old sore, so that you may use your own judgment as to whether you tell them or not.

Sampson told me the happenings in his own vicinity, that is, the doings of 300 men who comprised the unit he belonged to. At the battle of Ypres, the Germans attacked suddenly, but the Canadians mowed them down with their machine guns. The Germans retreated, then under the cover of their gas fumes attacked twice more. The 300 Canadians referred to dwindled down to 15, and among them were Sampson, poor Don and another chap.

The 15 men got together and debated on their future movements. The Germans coming on again, and the Canadian survivors decided that it would be useless to try and hold a front with their numbers which took 300 men to rightly defend. They therefore came to the conclusion to leave the trench, go over to the other side of the road and join the Canadian Scots and cover the gap their leaving made in the line, by an enfilade or cross-fire. Don and Bush (I think his name was) were first out of the trench; Sampson was the third man. Just as he had climbed out, Sampson heard a "Jack Johnson" coming, and he hurriedly threw himself back into the trench, but, not a moment too soon, for the shell exploded, blew the trench in on top of him and covered up all but his head. Finally he extricated himself, got up but found that two men had been blown in on his legs and feet. He pushed them off. There were Don and Bush. He spoke first to Don and then to Bush asking them both if they were hurt, but neither answered.

He says poor Don and Bush showed no signs of wounds; therefore it was his belief that the concussion of the shell killed them. As the Germans were coming on again, he left the two boys there lying dead, and crawled away.

Sampson says Don was a fine chap, and that he liked him very much.

As I said before, this man was the last man to see poor old Don alive, and therefore I have written all he told me."

GETTING ON

While the losses of members in many Canadian societies have been heavy during 1915 and 1916, the Canadian Forestry Association is moving steadily forward.

GIVE THE ASSOCIATION A HELPING HAND TO PASS THE 4,000 MARK BEFORE MIDSUMMER.

This will be difficult unless several hundred members clip out the attached coupon NOW and fill in a name of a friend.

You need send no money until September next and then only a dollar bill. There is no strict prohibition of course against enclosing the dollar with the application.

Just suit yourself.

The new member will receive twelve issues of the Canadian Forestry Journal, and eight or ten small illustrated books dealing with forest protection.

Here is the coupon. Start at it now.

Secretary, Canadian Forestry Association,
Booth Building, Ottawa.

Make the following a member of the Canadian Forestry Association. In September, 1916, the annual fee of

a dollar will be paid by {him / me}

.....

.....

.....

A Voice From the Forest

Fire Fighting Requires Aid of Mechanical Apparatus but Good Trails are the First Requisite.

February 15, 1916,
Cranbrook, B.C.

To Editor, Canadian Forestry Journal:

I have read the article in the Canadian Forestry Journal, with reference to a portable gasoline forest fire fighting pump, by Mr. H. C. Johnson, Fire Inspector, Board of Railway Commissioners. It is a step in the right direction. At the present moment, however, it could not be used to advantage in the majority of localities because of the lack of trails, so we come down to the old point, viz., trails and more trails and as Mr. Johnson justly states in his article, good and reliable topographical maps. There are very few such maps covering forested areas in this country, Canada. Given good trails and the construction of artificial water supply where natural supply fails—which is not a very difficult or serious matter—then mechanical apparatus would be a godsend to the men in the field. I have always thought that the present policy is very haphazard in regard to "fighting" forest fire. There are all kinds of schemes for discovering fires, but they do not appear to have evolved many methods for extinguishing them. A fire starts at a given point, the wind is in a given direction, and if a man has only got a map of the locality which is reliable, he would soon then be able to have a general plan of campaign, cut and dried. Given the above data he can then make a fair guess in what direction the fire will run. As a rule, there are no reliable maps, there is some one man who happens there are no known trails, unless to be around who knows the country and carries such knowledge bottled up in his head, and so time is wasted trying to stop the fire at no particular vantage point, until probably hours, and days, in some cases, afterwards when some one has had a look over the ground. This vantage point should be known beforehand, and a concentration made there, with a line of retreat to the next defence, already known, in case of a sudden fall back.

"Not Enough Action."

With good maps, artificial water supply where natural supplies fail, as I have said before, not a very difficult or costly matter, and some attempt at organization, a portable fire pump would be a very useful and valuable weapon in the hands of the men in the field. There is too much talk as to what should be done and too little action taken in the field. What is wanted is more of this talk put into action. The average forester seems to think that when a decent map and estimate is made that all is done. Both are extremely useful, but do not go far enough. Fire wardens are asked to send in reports giving hazards, probable points of danger, advocate such and such trails, all of which is usually squashed at head office, very neatly filed, and the matter dropped. This information should be marked on a plan, the wind currents assumed in the varying directions and a cut and dried plan of campaign agreed upon for the different situations in relation to the wind currents. With fairly accurate plans

Bovril develops big reserves of strength

When Sir Ernest Shackleton was selecting extract of beef for his Antarctic expedition he said:

"IT MUST BE BOVRIL"

(not of a miscroscopic order but of a sufficiently large scale so that a man in the field can readily recognize the physical features) in the hands of the fire rangers on the ground, all these points can be located. Of course, these things cannot all be done in a year, or two, but take time. Present measures in the field are not systematic enough, but are over-systematic in the office. In the field, it is rather in the nature of nibbling a little over the whole area. It would be far better to take so many square miles every year and make detailed plans, reports, etc., then whilst the next lot, or grouping of square miles, was being surveyed, and reported upon, the first group of square miles could be having trails, roads, fire lines, fire guards, lookout stations, telephone lines, water supply, shelter cabins, being built, all with a view to the point that any portion of the area would be accessible to fire fighters.

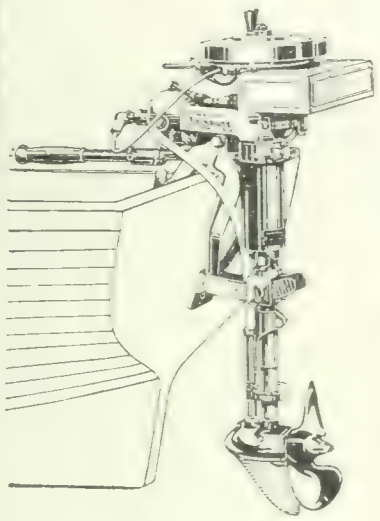
A Retaining Fee?

Another thing I have found is that men dislike fighting fire, that is, the public, and it is very difficult to collect men to do this work. How would it be to have a scheme whereby ranchers and farmers living in the vicinity of forested areas be paid a small retaining fee or sum of money, with the understanding that they are bound to turn out immediately when called upon. A ranger could then always be reasonably assured of a semi-permanent force of men at his call. I know the public can be compelled under the law, and even if they come willingly there is always trouble afterwards about pay, and it is a very difficult matter to get them to come a second time. If you attempt to enforce the law, they merely laugh at you, and you have not got the time to travel possibly some considerable distance to put the machinery of law into action, and probably, if you did so, and got a conviction against offending parties, he and his friends would in the general terms "get you" afterwards. Such action on your part would queer your chances of getting men in the future to fight fires.

Something Tangible.

It is all very well putting up notices and telling the public that they are forest guardians, but they require something tangible to make them feel bound to come forward when required. It might be worked on the fuedal system in that, each should bring any man he can spare, or should collect any men he knew of. For example, the ranger discovers a fire, he notifies T., T. then notifies A. B. C., and so on. Each brings a retainer and so you have a crowd collected in no time. T. A. B. C. being paid a small retaining fee per month during the fire season, not a large sum, but just to make them feel bound to lend a hand. It might be considered too expensive,

EVINRUDE



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A practical, powerful and reliable gasoline motor that can be attached to any rowboat in less than a minute; may also be attached to canoes, duck boats and all manner of small craft. Easy to handle and extremely economical to run. Will last a lifetime in ordinary use.

Very efficient for towing heavy loads.

Exclusive features of the EVINRUDE motor: Built-in-the-flywheel Magneto and Automatic Reverse.

In addition to the 2 H.P. and 3½ H.P. models offered heretofore, which are of the 1-cylinder, 2-cycle type, a new model is being placed on the market. This new model is of the 2-cylinder, 4-cycle type and develops fully 4 H.P. It has been especially designed for speed, giving easily from 8 to 9 miles an hour, with an ordinary boat. All the conveniences and safeguards which distinguished the 1915 models will be found in the new 1916 EVINRUDE Speed Motor.

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but I know that more money should be spent in the field than is now spent, and I also know that the average "Public" is not altruistic as a rule, and a small retaining fee would help his forest patriotism, or whatever you call it, a whole lot. The old fashioned methods of fighting fires in the forests can never be done away with but can be greatly improved upon, and there is no reason why better tools cannot be placed in the hands of the men who have to do the fighting. It is a wide field and high time the actual fire fighters should be given better tools to work with. We carry water now, at least we attempt to do so, in pails, tin cans or anything we can grab, but there is mighty little of it reaches the fire. If water can be got at all, it is the best weapon with which to fight fire, and nobody but a fool will argue otherwise. The introduction of mechanical apparatus to aid the fire-fighters, really sounds solid, and is a step in the right direction and there is no reason why it can not be brought to perfection.

Trails Come First.

Trails, however, are the basis of the whole thing, not built in a haphazard manner, but built to the very best advantage. For fire-fighting purposes a trail need not lead anywhere definite provided it has a strategic value from a fire fighting point of view. In fact trails, out-

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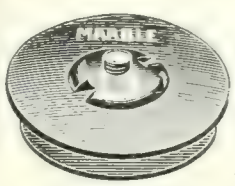

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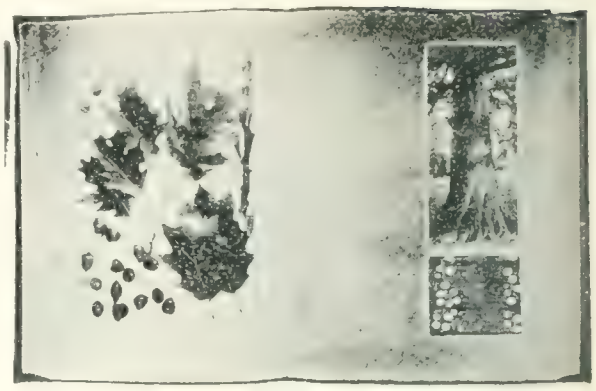
side of those connecting two places or points, should be of two kinds, viz., patrolling trails, preferably on the tops of ridges, and fire trails or feeders to strategical points. Main trails should be eight feet wide and all others four feet, grades being not greater than one in seven.

India and Canada's Trade

One of the newspapers of India thus comments upon the visit of Mr. H. R. MacMillan, Special Lumber Trade Commissioner for Canada:

"In the past five or six years we have heard of very nearly all our colonies sending abroad all over the world Special Trade Commissioners. I have not seen it suggested that the Government of India have ever considered the question of appointing such Trade Commissioners to travel around and consider trade questions affecting his country. With all the talk we hear of India getting some larger share of the world's business after the war is over, it rather strikes one that the present would be an excellent time for a representative of Government in the Commerce and Industry Department to make a tour round and see a few things from a practical point of view in relation to Indian trade requirements and the capabilities in the way of supplying products. The Canadian Government saw the possibilities of the position months ago and we have in Calcutta now the Chief Forester of British Columbia who has been sent round the world by his Government as a Special Lumber Trade Commissioner; one of the ideas of Mr. MacMillan's commission seems to be an investigation as to the possibility some day in the near future of trade reciprocity between Canada and India. Hitherto, as is well known, such Indian commodities as there is a demand for in Canada have gone into the Dominion Colonies via America with the assistance of American finance and through American merchants. But



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as the purchasing power of Canada increases, it stands to reason, Canadian merchants should be able to, and should be encouraged to deal direct with this country. The ports in British Columbia should offer as good entrepots for merchandise from India as any on the American Pacific coast. The establishment of a direct steamship line between India and Canadian Pacific coast ports is only a matter of time. It is understood that the policy of the Canadian Government is not to subsidise impractical dead heads, but to assist its active industries by introducing them to the notice of the world's markets; and at the same time assuring consumers abroad that Canada is capable of supplying what her Government Department, after investigation, are satisfied that she can supply. It is a simple proposition after all, and it is real business, and about as far as a government ought to go. There is probably less commerce subsidising by foreign governments than many of us believe. Subsidies are not always the best incentive to forcefulness and independence and self reliance."

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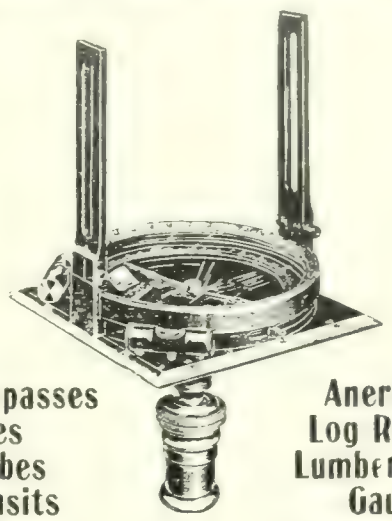

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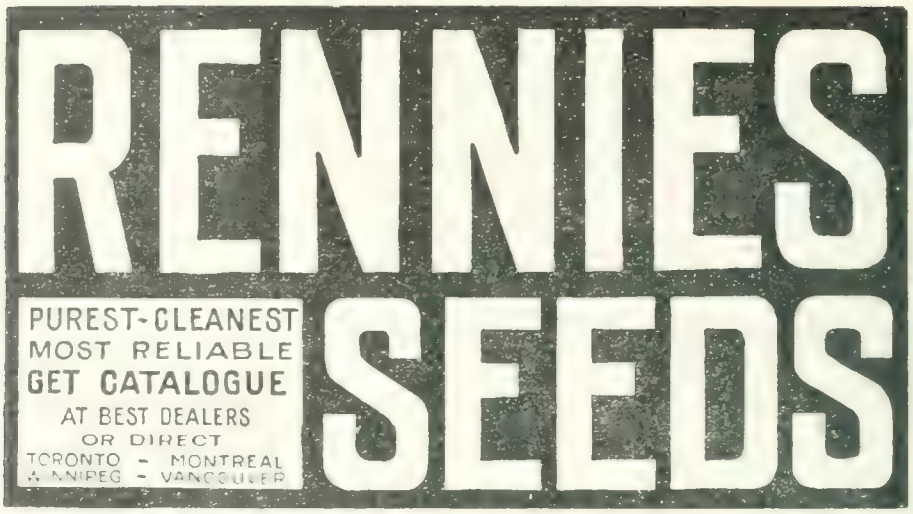


Making Sure of a Future Forest

From an Article by

R. O. Sweezey, in Pulp and Paper Magazine.

In this country the principle of conservation has awakened such a sympathetic response from all intelligent proprietors of forests that we find, not only the inauguration and vigorous application of elaborate and efficient fire protective systems, but such advanced practice as reforestation on an important scale being introduced by one of the leading pulp and paper firms.

Because we are erroneously basing our calculations and methods on conditions that existed years ago, before the pulpwood industry held sway, I maintain that we shall soon realize that the capital wealth of the forest is being depleted with little or no prospect of renewal. Areas that are logged over to-day—even though the logger adheres scrupulously to state laws for cutting—are in grave danger of becoming mere "wind-falls" with a possibility of a future "cut" over the same area a very speculative one indeed.

But why should there be any uncertainty about the same area producing in a reasonable time a forest crop just as good as the one being cut to-day?

Taking Care of Seed Trees.

Do we not find areas that were even burned over — perhaps 100 years ago—offering good pulpwood crops to-day? We do, indeed, and such areas have been grown from seed, too. But had there been no old spruce trees scattered about in little patches that escaped the fire the probability of a spruce covering would have given way to one of deciduous growth—examples of which an observant forester finds frequently enough.

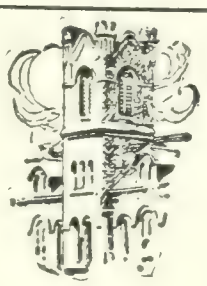
It is known by the forester of course that spruce seed, in order to have a fair chance to germinate, must come from a tree of considerably advanced age, and moreover, it is not every year that conditions are favorable for the seed. Hence by our present method of pulpwood lumbering in which only young and slender conifers are left we not only remove the old seed trees, but we invite the destruction of the remaining young trees by reason of their exposure to wind as a result of having cut the larger protecting growth. It may be stated, however, that if the year of cutting happens to be a good

seed year the chances of a new growth, from the seed of the lopped off tops, are fairly good. By this method though we would be trusting very flimsy hopes for the future of our forests.

To remedy the evil nature suggests an easy and inexpensive method. Good example being found throughout the country the mention of one here will be sufficient. In the Upper Ottawa region a certain area of some fifty square miles was swept by fire about 75 years ago, and although the destruction was complete on the burned parts there is growing on them to-day a dense covering of valuable spruce which sprang up from seed supplied by the fortunate presence of scattered clusters of five or six to fifteen or twenty old spruce trees, which escaped destruction at the time of the fire. Elsewhere the same fire swept some areas clean, leaving no such clusters of seed trees with the result that only deciduous trees have sprung up.

The Spring Fire-Peak

If the forest fire danger was represented by a line rising and falling as the danger increased or decreased there would be a sharp rise or "peak" in the few weeks after the winter snow leaves the woods. This is so much the case that the term "Spring Fires" is well known to every forester. The ground is dry, the dead leaves and herbage are sapless and tindery, and the least spark may start a fire that will sweep whole miles of forest. All who go to the woods are cautioned to see that they are especially careful to put out completely their camp fires and to see that no fires start from matches, pipes, cigar stubs or fire arms. Canada has many fire guardians on duty at this season but if these rules are observed much more timber will be saved than can be saved through the most strenuous efforts of fire fighters. The time to stop a forest fire is before it starts. Canada is in a war that is taxing her resources and every patriotic citizen will do all he can to prevent the enemy being helped by the destruction of Canadian resources.—(Publicity Bulletin of Dominion Forestry Branch.)



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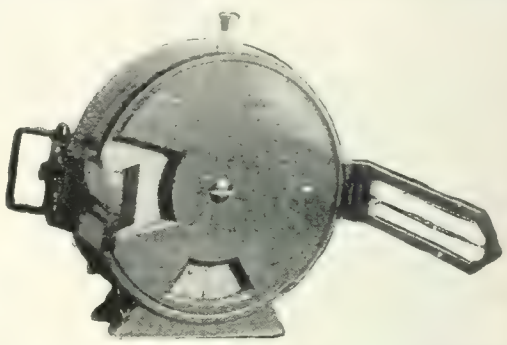

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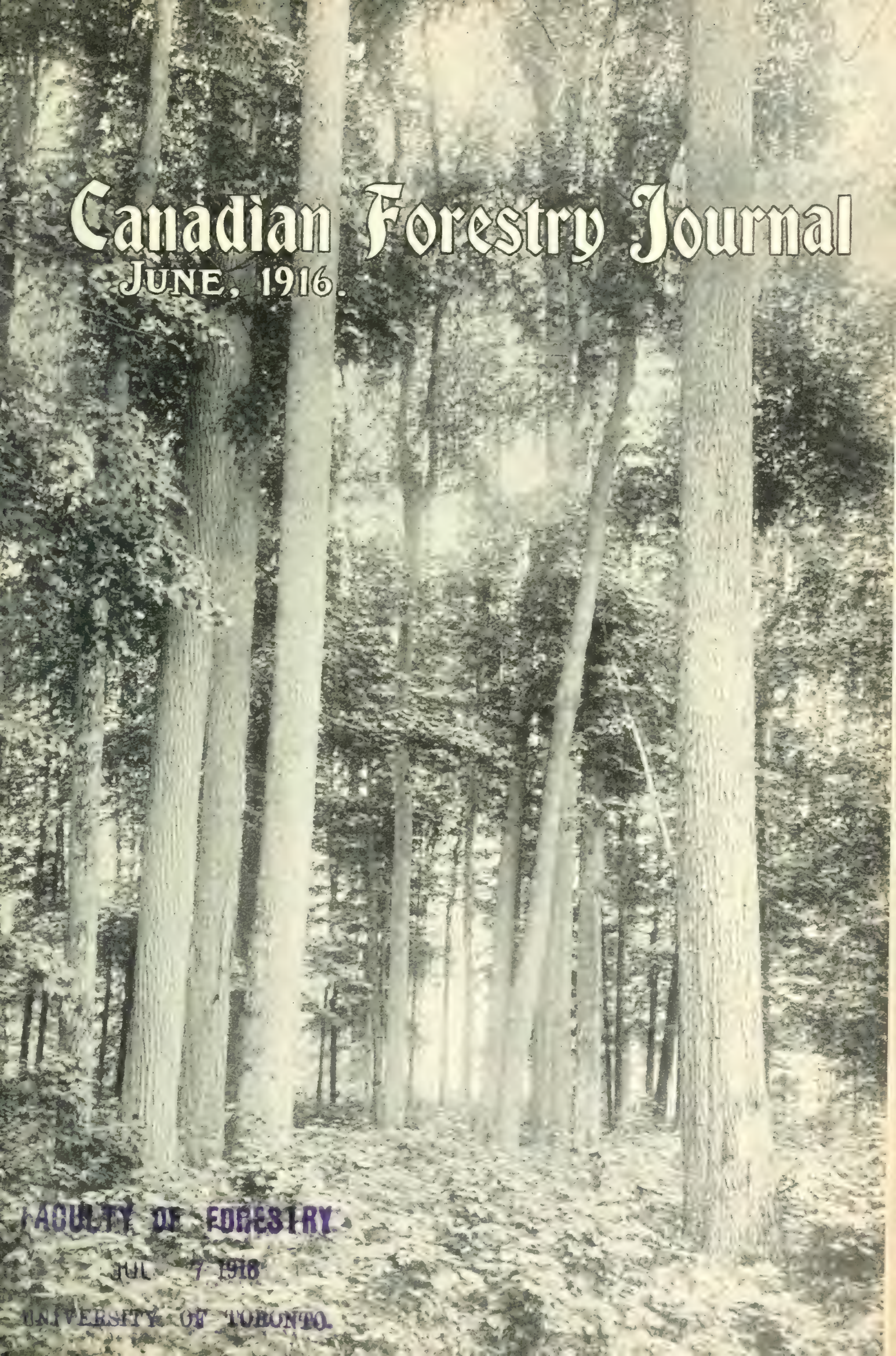

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VOL. XII

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Military Demands on French Forest

Severe Cutting for Trench Purposes Creates Perplexing Problem for Government Forest Service

We gave some description recently of the destruction that has been wrought in the French forests by the artillery of the contending armies and of the suggested plans for reforestation after the war. There are some interesting notes in the "Revue des Eaux et Forests" in regard to cutting that is being done in the forests for the requirements of the French army, from which the following notes are taken:

Timber operations more and more important are being carried on in the Government forests for the needs of the army. After the smaller trees the finest trees of the stand are now being cut in several places. These operations are especially intensive in the forests situated at the front near the armies. The military authorities state that on account of the necessity of working rapidly and on account of the difficulty of transportation by railway they cannot go far for the wood which is required, and as the front changes very little the result is that the same forests are being constantly placed under contribution.

Military Needs Urgent.

The necessary consequence will be great lack of wood in certain regions of the north and east of France after the war, the more so because very probably the Germans will leave more or less completely ruined forests situated in the same region on the territory provisionally occupied by them. There is enough in that to disquiet and even to frighten those who while occupying themselves with the present situation are not disinterested in the future. It is greatly to be desired that the armies should look for wood in the interior whenever they can so that the impoverishment may as much as possible be spread throughout the whole of France and not confined in large measure to the regions to the north and east already so terribly tried in other ways.

On the other hand, always under the necessity of haste, the operations carried out by the military parties have taken place often under more or less defective conditions. Evidently the rules of management and silviculture take second place in the present circumstances, but that is far from taking no account of them at all. There is nothing opposed to the cut being arranged according to the prearranged order of the rules for operations. However, it is often very difficult to reconcile the imperious demands of the army's needs which must evidently be given consideration before anything else, with operations satisfactory to the future of the forest. The military men think that the forester gives them wood that they want too parsimoniously. They do not think that if the French forests had not been administered with a wise foresight and with the object of conservation they would be far from being able to provide the heavy demands which are now imposed on them. In place of reproaching the foresters with being conservators, the military authorities ought rather to congratulate them on having been so.

The foresters who have the task of administering the forests at the present time fear that the military authorities ask very much more

wood than can be taken without compromising the future of the forests of which they have charge, and it must be recognized that some of the operations carried out by the army not only in the war zone where it is very difficult to limit the damage, but also in the interior zone, give some ground for these fears.

On the one hand, on account of the present circumstances great sacrifices have to be made. From this point of view France finds herself in the position of an individual who during long years has practised economy and who having to face extraordinary needs, imperious and urgent, sees himself in the absolute necessity either to take from his savings or to appeal to his neighbors. Who is there who in such conditions would hesitate to take from his savings the assistance which was necessary?

Precautions in Cutting

On the other hand, it is assuredly necessary to safeguard the future of the French forests, the utility of which appears greater and even greater from the fact of this war. It is absolutely necessary for the operations to be carried out in each forest that the operators should be well acquainted with the treatment adopted, the management established, the object desired, and the rules and conditions which it is indispensible to apply to reach that object. No cut ought to be made, no tree ought to be taken if that would be harmful to the future of the forest. Any precautions that may be necessary to avoid compromising the future of that forest ought not to be neglected.

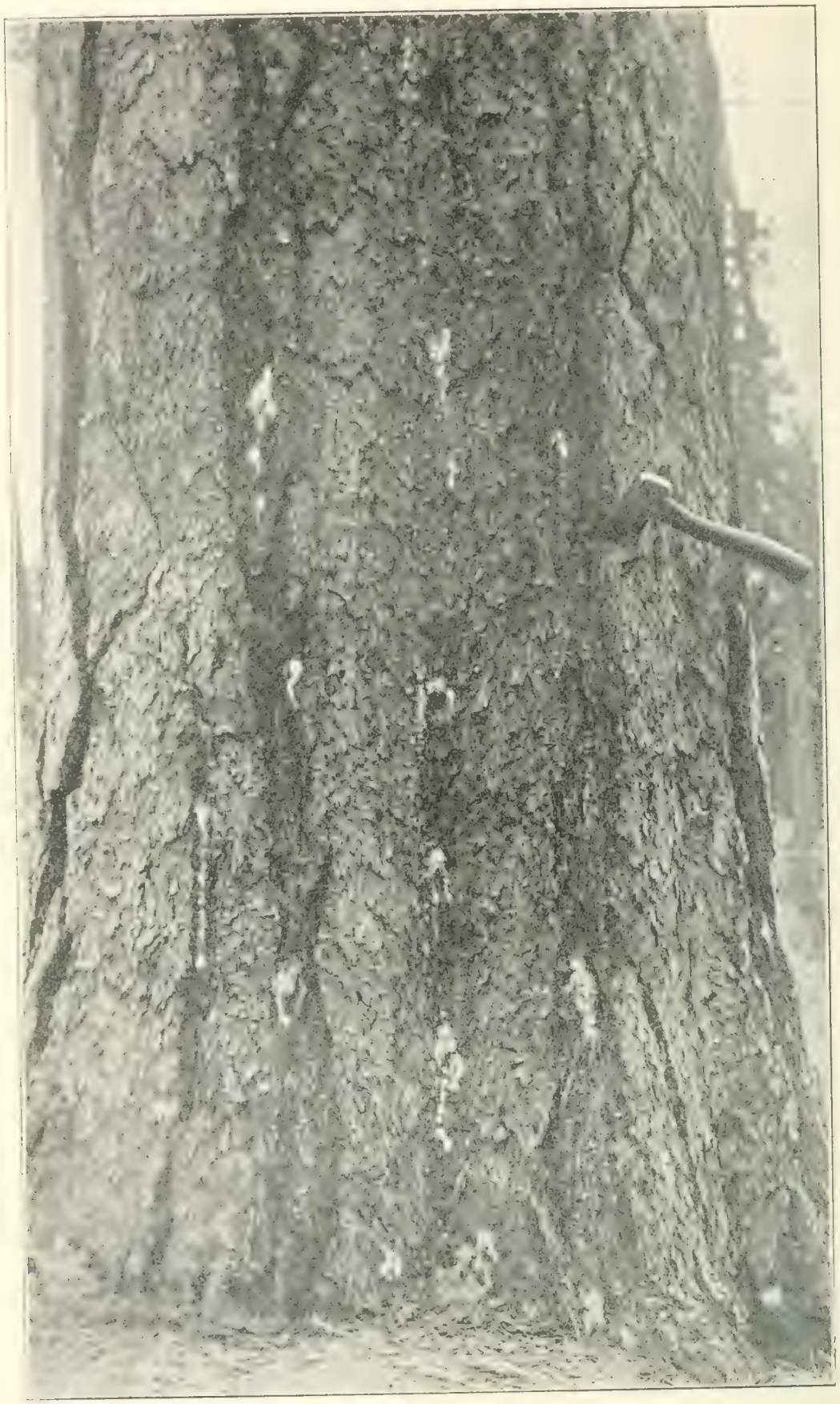
And it is not necessary to believe that it is absolutely impossible to reconcile these contrary interests. Thanks to the great reserves of material accumulated by the wise management and foresight of the foresters the French forests can furnish much wood without being obliged to sacrifice their future.

Saving the Settler from Cropless Lands

The opening up of non-agricultural lands to settlement has produced some of the most far-reaching and pitiful tragedies in the Dominion's history. Every province has communities which have been permitted to make the fatal error of a bad location. Their subsequent history is an unbroken line of bad crops, poverty, suffering and human demoralization. Too poor to move away, the farmer and his family resign themselves to a pitiful standard of living, giving their time and efforts for practically no return.

Every province and the Federal authorities have made such blunders in times past, nor is there satisfactory evidence that a general and complete reform has been brought about. Farmers still are allowed on Federal and Provincial "homesteads" which are impossible for field crops. The policy was, of course, more the result of laxity in classification and not a deliberate effort to send settlers to useless lands. The laxness, however, is growing in public disfavor, and the tendency of all governments now is to protect the settler and to conserve rocky, sandy areas for their natural purpose of growing trees.

Several survey parties are engaged on soil examinations this summer, and such work is bound to achieve higher importance in the eyes of governments. One party, composed of Messrs. F. C. Nunnick, of the Commsision of Conservation, and Walter Graham, of the Experimental Farm, Ottawa, are in New Brunswick co-operating with the Provincial Government in a scheme of land classication. The project deserves the hearty support of conservationists everywhere for the benefits are far from local.



Dying Bull Pine showing gum tubes of Dendroctonus on the bark —Princeton, B. C.

Ravages of Insects in Canadian Forests

An Expert's Discussion of the Enormous Damage Annually Caused to Standing Timber and Logs

By J. M. Swaine,

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"The insect injury to Canadian Forests certainly amounts to many millions of dollars annually, probably varying between twenty-five and seventy-five millions."

Injuries by forest insects, through which trees are weakened or killed, logs are reduced in value or rendered unfit for use, and forest products ruined by boring grubs, are causing a very great annual loss in Canadian forests and to consumers of our forest products. All our forest areas are subject to such losses, although not all to a like degree.

It is impossible to make an exact or even very valuable estimate of the money value of the losses incurred in this way. Much of the injury occurs in northern or mountain areas, or other sections beyond the present boundaries of the timber limits, where the young growth is of more importance than mature timber. Timber killed by insects may enable fires to obtain great headway and thus contribute toward more extensive injuries. Serious injuries to reproduction are quite as important as the destruction of grown timber, but the money value of the loss can be estimated only very roughly. The majority of our fires, like extensive bark-beetle outbreaks, kill the timber without destroying or greatly injuring it for lumber. The lumber in these standing trees would be sound and good for many years, unless burned again, were it not for the insects, which almost immediately proceed to riddle the trunks with holes, and the parasitic fungi thereby given access to the inner layers of wood. The destructive agent in such cases is not the fire but the boring grub, and the prevention or quelling of ground fires is merely a very effective method of forest insect control. The outline to be given will make it plain that the annual loss in Canadian forests from insect injuries is very great. In American forests it has been estimated that "the amount of insect killed and damaged timber left in the woods, plus the reduction in value of that utilized to be charged to insects is not far from an equivalent of 10 per cent of the value of the annual output of forest products of all kinds in the rough." This would make the annual loss from insect depredations in United States forests approximately of the value of $100,000,000.

Canada's Enormous Loss.

The insect injury to Canadian forests is probably somewhat less than

in the United States. We have not yet sufficient information to enable us to make any definite estimate of its value, but it certainly amounts to many millions of dollars annually, probably varying between twenty-five and seventy-five millions.

The most important insect enemies of Canadian forests may be considered under the following heads: Borers in trunks of living trees; Borers in logs and trunks of standing dead trees; Defoliating insects; Bark-beetles in living trees, and Borers infesting wood products. A few representatives of each group will be mentioned.

Borers in Living Trees.

The well-known Poplar Borer, *Saperda Calcarata,* is an excellent example of this group. Everywhere abundant, its large whitish grubs perforate the trunks of poplars with large irregular tunnels, thus weakening the trunk, checking the growth and admitting fungus spores to aid in the more rapid destruction of the tree. In some districts full-grown poplars are almost unknown. There is no method of control applicable under forest conditions.

The Locust Borer, *Cyllene robiniae,* is practicaly exterminating the locust trees in parts of Ontario. A block of these trees in the forest belt about the Central Experimental Farm at Ottawa is now practically destroyed by them.

The Western Cedar Borer, *Trachekele* sp., an enemy of British Columbia cedar, is the most important of our borers in living trees, when the value of the timber destroyed is considered. Although a closely related beetle has long been known in Washington and Oregon forests, this injury has only recently been reported from British Columbia. That it has been working there for many years we know. The grubs are found working only in living trees, and this summer Mr. Chrystal and I found its old tunnels in cedar logs which had been killed by fire eighteen years ago. The grubs cut flat slightly winding, longitudinal tunnels through the heart wood or more rarely in the sap wood of the middle three-fourths or four-fifths of the trunk, usually working upwards end ending their tunnels in a pupal cell in the branches; a single tunnel was traced for forty feet. The tunnels seldom extend to the but end or to the extreme top and do not show at all upon the wood surface when the bark is removed, so that when the tree is felled and trimmed there is usually no evidence of any trouble, although the heart wood may be very thoroughly riddled with tunnels. Even when the timber is cut into logs or shingle bolts the injury is easily overlooked, for the tunnels are flat and filled with boring dust of the same color as the surrounding heart wood. We have never found the larvae in dead trees and only seldom in perfectly healthy trees; usually they occur in "dead-top" cedars. The habits of the beetles and the distribution of the injury in British Columbia are being carefully studied this summer.

These three examples will illustrate the type of injury caused by borers in living trees. Other injurious insects with somewhat similar habits infest both eastern and western forests.

Ruin of Valuable Logs.

Pine and spruce logs and standing trees, killed by fire or bark-beetles, are usually very badly riddled or destroyed for commercial purposes if left unprotected in the woods for two season, or even for one. The chief injury is caused by large whitish legless grubs, the young of large long-horned beetles belonging chiefly to the genus *Monohammus.* The grubs work in the wood for two seasons, going deepest and causing the most injury during the second season. An account of an example I saw last summer will illustrate very well this type of injury. On the north shore of Lesser Slave Lake

Back of Peachland, B. C. Black Pine Killed by Mountain Pine Beetle.

there are piled over two million feet of good white spruce logs in a series of immense piles. Two of these piles had been cut two and a half years previous to our visit and the remainder one and a half years, or two winters before. The outer layers of logs in the piles cut latest were infested with countless numbers of the grubs then boring actively and audibly from four to six inches below the surface. The large amount of fresh boring-dust from the tunnels and lying everywhere between the logs gave evidence of the destrucive work going on beneath the bark. On the older piles the outer layers of logs were completely ruined by the tunnels of the grubs, which had penetrated the heart wood and often passed completely through the trunk. At the time of our visit—July, 1915—the grubs had completed their two year's growth, transformed to adult beetles and all emerged from the logs of these older piles. Hundreds of thousands of feet of excellent white spruce had already been destroyed by borers in those piles, and much further injury will be done if no effort is made to prevent it. The whole loss could have been averted very simply by booming the logs in a nearby cove during the spring following the cut.

In the Wake of Fires.

Losses from these large boring grubs occur frequently in our spruce and pine limits, when logs are left behind in the woods. Fire-killed and wind-blown pine, spruce and balsam in our woods are usualy attacked by these beetles and the timber rendered useless within two seasons following the fire or storm. Fire-killed standing trees would remain excellent timber for many years if not attacked by insects and fungi or swept by succeeding fires.

Ambrosia-beetles excavate round tunnels about the size of the lead in a lead pencil deep into the wood of both deciduous and coniferous trees. The walls of the tunnels are stained black by a fungus which always grows thereon. The loss in reduction of value is at times very important. The most destructive of these borers, because its tunnels extend deepest into the wood, is the Pacific Coast Timber-beetle, *Platypus wilsoni*, found in the coast region of British Columbia. It extends its

tunnels from eight to fourteen inches into the trunks, and occurs in countless numbers in logs of Douglas fir, western hemlock, lowland balsm and Sitka spruce. It attacks only weakened or dying trees and logs.

Defoliating Insects.

Among the best known of our forest insects are the defoliating or leaf-eating species; of these the larch saw-fiy, the spruce bud-worm, and the tent caterpillars must be familiar to all, and illustrate the nature of the injury caused by insects of this sort. A few of these defoliating insects are very seriously destructive in our forests, and unfortunately we have no direct means of combating them on large areas. Nature controls them, in a longer or shorter time, by means of their parasitic enemies and weather conditions. We hope some day to be able to assist materially in this control, by the distribution of the parasites, smaller insects which prey upon the pests; and the Entomological Branch is studying these problems from that standpoint.

The Larch Sawfey, the most destructive of the group, has killed immense quantities of larch within the last generation, from Nova Scotia as far west as Northern Saskatchewan, and will evidently extend its ravages throughout the range of the eastern larch. The larvae feed upon the leaves, and when numerous entirely defoliate the trees, and eventually kill them. It does not yet occur on the western larch in British Columbia, although it feeds readily enough upon cultivated specimens of the western species in the Arboretum at Ottawa. The wide gap (nearly 600 miles) between the ranges of the eastern and western larches will be a safeguard to the latter species.

The Spruce Bud-worm, in its caterpillar stage, attacks the buds and later the leaves of spruce, balsam, Douglas fir, hemlock and larch. It is most noticed in spruce forests. While it has been known to kill large numbers of trees, particularly balsam, its parasites usually effect control before very serious damage is done. This has been the history of the recent outbreak in the Quebec and Ontario woods. It is always to be feared that spruce weakened by the bud-worm will be attacked by destructive bark-beetles. For this reason, bud-worm weakened spruce should be watched during the seasons following a bud-worm attack, and if any considerable numbers of spruce are found dying in clumps or groups an investigation should be made at once.

Fire is, of course, our most serious enemy to forest reproduction. Squirrels eat each season countless numbers of seeds, and immense numbers of young trees are girdled and killed by rabbits and porcupines. A large amount of young black pine was killed in this way, apparently by rabbits, in the Jasper Park region during the winter of 1914-1915. In addition to these and other enemies, reproduction is seriously affected in many rgeions by injurious insects. Certain species of caterpillars, beetles and chalcids feed within the cones or seeds of pines, spruces, hemlock, balsams, larch and Douglas fir, and more or less completely destroy the seeds. Still other species feed upon the seeds of certain deciduous trees. The extent of this seed destruction sometimes assumes serious proportions, and its effect upon reproduction must at times be most important. Certain species of boring caterpillars are particularly injurious to young growth of pines by girdling and killing the branches and tops an ddestroying or killing the trees. The white pine weevil, *Pissodes strobi*, is a serious enemy to white pine reproduction in the east. The grubs of this species destroy the top or leader of young trees; the result is a "double-top" or at least a distorted trunk of little use for lumber.

(To be continued in July issue.)

Consumers Must Pay Higher For Canadian Wood Supplies

Pulp Mills Going Farther Afield For Their Raw Materials Will Tax Canada's Spruce Resources

(By Cyril T. Young, In Charge of Ontario and Quebec Land and Timber for the Canadian Northern Railway System.)

[The following article, prepared on request by Mr. Young, is a militant call for protection of our Canadian timberlands from every form of waste. Mr. Young has gained a close and accurate knowledge of the forest resources of Northern Ontario and Northern Quebec from Lake St. John through to the Manitoba boundary, and from the Ottawa River and the Great Lakes through to James Bay during his twenty-two years of field experience and subsequent contact with transportation interests.

If, as Mr. Young declares, the consummer must pay more for his paper and the paper mill must spend more cash on the raw supplies of pulpwood from the Canadian forests, then must follow a higher valuation on spruce and balsam and other pulp producing areas, rendering their protection and perpetuation a matter of greater urgency on governments and limit holders.—Editor.]

The same awakening is coming to us later on our pulp wood area as we received in our high-class white pine area a few years ago; and American mills are now going far afield for their wood, one rail haul delivery this winter being 846 miles, and quite frequently 700 miles. This is due not only to the constant erection of more mills but to the increase in the capacity of mills already erected on the American side. To date it has been the short log haul and easily driven timber and the 13 to 16c rate wood that is reaching these American mills. Supplementing this rail haul timber is the St. Lawrence and Anticosti wood which before the war was reaching points as far west as Erie on a $2.00 per cord boat rate prior to the present scarcity of bottoms and also though a much less quantity of Nipigon, Port Arthur, Knife River wood reaching Erie ports at the same figure or towed to Ashland on Superior and getting into Green Bay section by rail haul from Ashland South.

Lake Shipping Scarce.

The European conflict has not only affected shipments of pulp from Norway, Sweden and Russia, but the removal of the bottoms from the Great Lakes for either Transatlantic or coastwise trade has resulted in making Great Lakes delivery of pulp wood practically impossible in cost, except to the mills who own their own vessels and their loading and in some cases discharging equipment. This is resulting in increased demands—very strong at the present time—for rail haul wood from settlers' lands and patent lands in Northern Ontario and Northern Quebec, which can be exported to the American mills, and

"I personally know large sections grossly over-estimated at forty-five cords to the acre that cannot possibly cut more than four to five cords to the acre on the average. Spruce mixed with pine is sometimes quite deceiving and certain pulp wood areas further south estimated at ten cords to the acre average are to-day actualy cutting less than two cords to the acre."

when bottoms can be secured this applies to New Brunswick wood as well.

Export wood like timber must inevitably go higher, due to the scarcity of labor in Canada from enlistment and the demand from war industries which men find more congenial to home life than the woods employment affords. Added to this is the increased cost of provision, such as hogs live weight at $12.00 per hundred, and sugar at $10.00 per hundred wholesale, with no possible outlook than further advances in the provision market all round. Added to this is the increased and ever increasing cost of barking plants, saws, boilers, chain, rubber and leather belting, etc., several of which have gone up from 55 per cent. to over 100 per cent.

Increased Paper Prices.

The final solution does not lie in cheaper Canadian wood or decreased cost of transportation, but in increased paper prices during the period of the war, and as month after month passes without positive results, two or three or more years' war is not at all improbable. Canadian pulpwood operators selling to American mills are not now making any more money than heretofore and are taking immensely larger risks unwarranted by the profits obtainable. Personal friends of mine are operating all the way from the head of the lakes through to St. John and have made less money and some of them more debt within the past eighteen months than at any other period of their pulpwood operation. Many of the operators have had to close out entirely, and this is bad for the reason that in any business if the stream of consumable goods is steady economic life goes on smoothly; if for any reason the stream is interrupted more or less serious consequences always ensue. Operators should go further in insisting on financial assistance from the buyers, for these mill owners know that there is no greater help to legitimate business than well regulated and easy flowing credit.

Forests Unlimited?

Nor is the quantity for future supply to these American mills up to 19c rate by any means unlimited. Most convincing, indeed, is a map showing the pulp concessions granted in Ontario and Quebec, and if to these could be added those that will likely yet be granted on five good pulp and paper mills sites remaining in the North the result would be more so. Mill sites to manufacture the wood growing north of the National Transcontinental are impossible except at Lac Suel and none on the Nelson on the Hudson Bay line. I might also possibly add one on the upper waters of the St. Maurice above La Tuque. All the other waters are flowing north and will not be intercepted by steel within a quarter of a century.

Looking away to the future because some of our Canadian mills are yet going to have to go as far afield for their wood as the American mills, who are rail hauling 600 miles, are doing to-day, it would be well here to state frankly that their is no commercial timber for a hundred miles south of the waters of James Bay on the territory known as the James Bay Basin.

Only Near River Banks.

Many Canadian and American mill men have the idea that because they are told spruce is growing on

the banks of the Albany, lower Mattagami, Moose, Hurricanaw and Nottaway that Northern Ontario and Northern Quebec is all timber country. If they were to get out of a canoe and travel inland for days as I have done, not only below the last portages going down to James Bay, but away up on the rivers sometimes even south of the National Transcontinental, they would find merchantable timber does not exist back from the river banks. This is true of an immense area around Lake Mistassini, north and west of Lake St. John, where heavy fires have occurred, on across the Hurricanaw and Moose—on past Martin's Falls (the only fall in 300 miles of navigation on the Albany), and I understand from Indians on through Patrica to Port Nelson, for all this lowest bench of land is practically muskeg.

A Question of Accuracy.

It is all very well for reporters to turn up Departmental records of Northern exploration of 1910, showing 288,000,000 cords of spruce in the then explored section of Northern Ontario, but is it there out on the ground? It certainly is on the better sections of the Northern Clay Belt, such as Temiskaming, Abitibi and parts of Mattagami, Kapuskasing and Missinabi, but I personally know large sections grossly overestimated at forty-five cords to the acre that cannot possibly cut more than four to five cords to the acre on the average. Spruce mixed with pine is sometimes quite deceiving, and certain pulp areas further south estimated at ten cords to the acre average are to-day actually cutting out less than two cords to the acre.

Returning to the immediate question and summarizing: Woods labor will be seriously acute by Nov. 1st—wholesalers refuse to even guess where provision prices will reach—and equipment is proceeding skyward steadily.

Paper to Soar.

Before the termination of the war you will see "News" selling closer to $40.00 N. Y. delivery than the $25.00 now quoted, for even at present many of the mills have no reserve supply of wood, and everywhere the stock of "News" is getting very low, notwithstanding the fact that we are not yet in the low water period affecting the grinders and output. Our cheaper jack pine and poplar woods should be more utilized in Krafts and wrapping paper and then the logging of all timber together would cheapen spruce wood costs.

With South America, Asia and the entire Continent of Europe in urgent need of pulp and the public (with extra coin in their pockets from a false prosperity due to national loans) buying more war extras than they really require why should they not pay the cost of increased material—pulpwood?

Berthierville Nurseries

Under the direction of Mr. G. C. Piche, Chief Forester of Quebec, 400,000 trees have been shipped this year from the Quebec government nurseries at Berthierville. Of this number 250,000 were sold to the Laurentide Company Limited at Grand' Mére, 20,000 to the Riordan Pulp and Paper Co., 50,000 to the Perthius Seignory (for the sixth year in succession)and the rest to colleges and private individuals.

"There is no commercial timber for a hundred miles south of the waters of James Bay on the territory known as the James Bay Basin."

An Avenue of Green Ash, fifteen years from the seed, on the ranch of Dixon Bros., Maple Creek, Sask.

The War and the Small Birds

(From "Revue des Eaux et Forets")

It is with great pleasure that I have received from various regions of France news about the number of small birds. Especially in the east, in the west and in the southeast the birds are more numerous than in preceding years. The quail, so rare two years ago, has returned to some extent everywhere; they were pointed out to me in the neighborhood of Belfort, where they had not been seen for a long time. Partridges, thrushes, blackbirds are numerous; the starlings have become much more numerous. The fine swallows which defend us from mosquitoes are numerous, perhaps because they have not been able or did not wish to settle in the many villages which have been destroyed in the north or the northeast.

However, most of the small birds have become familiar with war, as many species, like the pipit and the lark, are not afraid to settle on the firing line beside the batteries or the first line trenches, as the Count of Tristan pointed out to me at Nieuport. The greenfinches and the linnets, not having found bushes for their nests, have settled on the ground.

The war will thus have an appreciable influence on the increase of the small birds which eat insects and grain. This favorable situation is due:

(1) To the absence of hunters.

(2) To the absence of poachers.

(3) To the numerous places of refuge which are offered by the badly cultivated or uncultivated fields. Thus in the south on account of the scarcity of farm workers who are all mobilized the grape vines have become vertiable bushes. The birds are not being disturbed in their mating and the rearing of their broods by farming and especially by copper sulphite treatment of the soil have made of these vines real breeding places.

In other places various delays in the farm work have saved many a brood.

(4) The boys, being employed at work in the fields, no longer employ their holidays in wandering into the commons and the woods to dislodge the birds from their nests.

(5) The high price of food has in the villages reduced greatly the number of dogs. As we know these animals scour the country all day destroying many nests. A correspondent tells me that he now hears but rarely the barking of dogs wandering far from the villages.

New Fire Laws for the Prairies

The Provinces of Manitoba, Saskatchewan and Alberta have now brought into force "acts for the prevention and suppression of fires." The design of the acts in the two latter provinces are practically identical and in their general outlines agree with the legislation of Manitoba.

The Manitoba Act, however, appears to have a closer application to the question of fires set on the borders of Reserves which frequently do heavy damage to timber growth. A ranger on a lookout tower in one of the Manitoba Reserves counted no less than 38 fires in progress at one time, and all were within striking distance of the timber area.

Under the Manitoba Act, as recently amended, a municipality must appoint three fire guardians. These officers are made responsible for the investigation of conflagrations of all kinds, and the municipality is bound to apply adequate penalties to guilty parties. A Provincial Fire Commissioner, Mr. Lindback, has wide powers under the Act.

Such a law should result in better protection for the reserves against fires working in from settlers' lands. Heretofore the rangers have had no legal recourse even with evidence of flagrant carelessness in land clearing operations. Now it will be obligatory upon the municipality to control its fires and to answer for damage done to all forms of property, forests included.

The Acts of Alberta and Saskatchewan do not appear to go as far as the Manitoba Act in placing the onus of blame on municipalities in which a fire originates. The secretary-treasurer of the municipality is made the responsible local officer under the Provincial Fire Commissioner. Section 7 of the Alberta Act, however, should bring forest fires within the purview of the Act:

"The local assistants of the Fire Commissioner shall investigate or cause to be investigated in a general way the cause, origin and circumstances of every fire occurring within the limits of their respective jurisdictions by which property has been destroyed or damaged with a special view to ascertaining whether such fire was the result of negligence, carelessness, accident or design."

Clause 2: "Such investigation shall be begun within three days not including Sunday of the occurrence of the fire."

Canadian Woodsmen Interest the English

London, June 10.—The timber problem supplies a very interesting sidelight on the war. It is being dealt with speedily and efficiently, and very shortly the expert Canadian lumbermen who are over here engaged in the scientific method of thinning out certain of our most famous woodlands and hewing and shaping the timber for immediate use will be working at full pressure. To get to work in earnest they are only waiting the arrival of their milling machinery.

At present they are marking down and surveying certain tracts of forest land, "blazing" the trees—mainly the soft wood trees of pine and fir—and so arranging their scheme of attack that the beauties of our rural scenes shall not be unnecessarily marred.

Yesterday afternoon, in the course of a long walk through the beautiful Forest of ——, certain parts of which have been earmarked for slaughter, a Daily Mail representative met a little party of pioneers surveying.

Soldier-Trappers.

They were brown ,lithe woodsmen—half-soldiers, half trapper, and wholly romantic. They were diagnosing the cases of certain tall, feathery-topped pines very much as a doctor deals with his patient, and jotting down their calculations in a charted case-book. Already behind them could be heard the battle-music of saw and axe, broken into now and again by the sudden scream of the steam-driven "circular." Sundry gaps appeared now and again in the dark line of foliage—each gap meant the fall of a giant, and no giant has ever been dismembered so speedily as he. Half an hour ago a king of the glade, he was now a neat pile of railway sleepers ready for the track.

"If we had all our tackle here," said one of the pioneers, "I guess we'd be able to turn you out a complete box of matches from the waste product of that tree—and do it while you wait!"

This soft-voiced, keen-eyed young man seemed to know everything there is to know about the trees and the forests of the inhabited globe, and how to make the best use of them. "You in Great Britain have over two and a half million acres of forest," he said, "and as a war-time asset trees and their product are so much fine gold—properly handled.

Valuable By-products.

"Apart from the timber proper, which is so much in demand for military purposes, the by-products are extremely valuable. In ordinary times the Austrian forests produce between four and five million hundredweights of tanning bark alone. Then there are very large quantities of turpentine and potash and gallnuts 'extracted' from the trees as well.

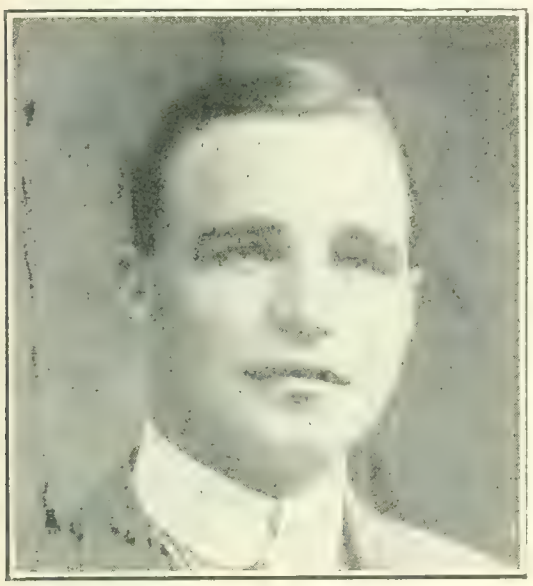
"In France the term of maturity for cutting the forests is determined by a committee of skilled officers and divided up into so many years, with each series of years representing so many blocks of forest to be felled. The annual cutting is so arranged as to cover a certain extent of ground, so that when one block is felled another reaches maturity."

Gold Mine in Wood.

Our Canadian visitors are struck at the richness and the beauty of our own magnificent stretches of forest. The English Crown woods alone cover about 125,000 acres, with the standing timber valued at anything between two and three million pounds.

A Day in a Dutch Forest

By H. R. MacMillan, Chief Forester of British Columbia, Read Before B. C. Forest Club, Victoria



H. R. MacMillan

Holland was originally heavily forested, chiefly with oak forests. Through wars, careless cutting, fire and pressure of population, the forest was gradually cleared away. Large areas of land when denuded of trees proved unsuitable for agriculture, and for hundreds of years lay unproductive in the form of sand dunes along the coast of the North Sea, on the islands and the Interior district of Arnhem, near the German border; or where the land, though sandy, was too level and too poorly drained to form dunes, it became known as heath. At the present time there are in Holland 1,272,403 acres of heath.

The land, forest and otherwise, as elsewhere in Europe, has passed through various ownerships which have profoundly affected its present forest condition. In very early times title was vested in "marks" under a German system of community ownership. Dutch villages in Noord Brabant (152,000 acres) and in Limburg (98,664 acres) still own forest and heath land which they acquired in 1462 from the French King who had before that time usurped the ownership of the marks. The ownership by marks and French kings gradually merged in ownership by the Counts of Holland, and by smaller owners who acquired forest and heath domain from time to time. The land in the possession of the Counts of Holland was in 1813 taken over by the state. The area of the state land, forest and heath, in the forest districts now is 59,746 acres.

Forest management of a kind began on some of these forests at a very early date. The area which I visited near Breda, extending to the Belgian frontier, where on the day of my visit the roar of the cannon could be heard, first received silvicultural attention in 1514, when Count Hendrik von Warsaw (whose city fell to his German compatriots on the day of my visit) seeded the sandy heath with Scotspine and the loamier soils with oak, forming a forest which still exists. In a similar manner, with but little plan until the eighteenth century, land was seeded by various owners throughout Holland and fine forests created, which have, without any soil cover, greatly exhausted the soil.

Though the state took over the ownership of the forest lands in 1813, but little advance was made in their management. Until about 1840 a policy was followed by planting oak in pure stands three to four yards apart for timber production in a rotation of 140 years. Then in 1840, according

to the present Forest Service, this policy was changed for the worse by planting oak eight to twelve yards apart and underplanting with beech, oak, chestnut and ash for coppice, a system which produced poor oak timber and impoverished the soil.

Initiation of a Forestry System.

Previous to 1890 there was no technical service in charge of Holland's forest lands, the administration being in the hands of the Land's Department officials. In that year an official of the Colonial Forest Service in Java was placed in charge of the Dutch Forest administration and an organization created which still exists. A branch of the agricultural department was created, known as the "Staatsbosch beheer," and charged with the administration of state forests and heath lands. The head of the service is known as the inspector of state forests and plantations. The headquarters of the organization are at Utrecht. The country is divided into Houtriesterij (forest districts). In charge of each district is a Houtriester or district forester. The composition of a forest district is well shown by the one which I visited. This district, the best timbered of any in Holland, was made up of five forests, each an administrative unit known as a Boschwachterij, and in charge of a Boschwachter or permanent ranger.

So well have these districts been mapped that in all official tables the area is given in hectares to the fourth decimal place, a feature of intensive administration which profoundly impressed the visitor from British Columbia.

The Houtriesters in charge of the five districts are foresters who were trained in the Dutch school of agriculture and horticulture, and later at Munich. The Boschwachters are strangely, for a country where the work is so intensive, are not encouraged to take any special training, and are not expected to secure promotion to the position of Houtriester. In order that the Dutch and Colonial supply of trained men may be developed a state forest school has been opened at Wageninigen in connection with the state school of agriculture and forestry, where a course is given, two years at the school and one year working on a Dutch forest under a Houtriester. The graduates are employed chiefly in the Dutch colonies.

When I arranged to visit the Dutch forest near Breda, I selected this particular district because the Houtriester spoke English. It was impossible to mistake him when I arrived at the station. A green felt hunting cap surrounded by two green cords ending in a tassel, the brim turned jauntily up; a dark green uniform, the coat double-breasted, buttoning tight and overlapping in front from one shoulder to the other with green corded epaulettes and two rows of darkened brass buttons down the front bearing in relief the Lion of the Netherlands, green riding breeches and black leather leggings. These were the markings of a forester who spoke excellent English, and as soon as I landed asked if I knew Overton Price, with whom he had studied a year at Munich in 1898.

A Mulitplicity of Forest Roads.

We embarked in a taxicab for the inspection of the forest. When there are no visitors along, the customary mode of travel is on a bicycle. The roads are as level as they must be in a forest district where there are only two contours, one for ten yards and the other for 15 yards above sea level. Whether or not because they are valuable chiefly for military purposes, the roads are all paved with granite sets. We visited first the Liesbosch, an oak forest existent since 1500.

The first feature which struck me was the very great number of roads. Nearly ten per cent. of the area is in roads. A plan of the forest looks like a city map. The roads are placed in all Dutch forests, 130 yards apart, both for purposes of fire protection and to reduce to a minimum the cost of removing the thinnings. The characteristic of the Liesbosch is that 400 years of growing oak both as standards and as coppice with practically no underplanting for soil cover has robbed the soil of all humus. Therefore, since the administration was started in 1890 the policy has been to make the improvement of the soil the first consideration.

The Forester has two classes of oak forest to deal with:—

(1) The pure stands planted before 1840.

(2) The coppice with standards planted since 1840.

The pure oak (Q. pedunculata) stands planted before 1840 are very open and the soil is unprotected and devoid of humus. These stands are being underplanted with beech and chestnut, which greatly add to the humus, and in a few years visibly affect the rate of height growth in the oak standards.

The coppice forests are being converted to high forest as quickly as possible by cutting out the coppice and holding over the most promising trees for the production of standards. As a result of this policy, since 1890 a comparatively large area of coppice has been converted to oak standards. It is interesting to note that the forests, which under French influence in Holland two to three generations ago were converted to coppice, are now under German influence being converted from coppice to standards. The Dutch are following in forestry the German practise very closely.

The prices received for oak timber are so high that there is no inclination on the part of the Dutch foresters to change the composition of their oak forests. The oak is cut at 140 years when 500 to 600 cubic feet per acre is the average production. The timber is sold in stump for $0.34 to $0.35 per cubic foot, and everything is measured. If the timber is very straight and suitable for piling in the canals and harbors $0.50 or more is secured. The coppice or underplanting is cut and sold the year before the oak is to be cut. This also is sold. small stuff 3 to 4 inches in diameter selling for $0.22 to $0.29 per cubic foot. Oak is greatly valued because of the use of the bark for tanning. After the timber has been cut and the stumps dug out and sold, a crop of lupine, followed by a crop of rye, is grown to enrich the soil. Then the ground is planted again with oak in-mixture with beech and elm, the intention being that a pure stand of oak will be produced with an understorey of shading and humus producing trees. The Liesboch of less than 497 acres of forest is managed on a sustained annual yield basis. The net annual revenue is $4.85 per acre.

A Scotch Pine Stand Described.

The other important forest in the district of the Maasbosch is almost wholly Scotspine, in very bad condition through having grown a pure open stand of Scotch pine without any understorey in soil protection for hundreds of years. The problem here is also to improve the soil and thus improve the yield. This forest of 1086 acres is divided by roads into 250 small tracts, in each of which the age and natural condition is different. The contents and rate of growth of the forest have been carefully measured, and of the 58,245 cubic feet that are produced each year, 54,715 cubic feet are cut. The timber to be cut is taken each year from the section of the forest that is in poorest condition. The tracts cut vary in age from 100 to 120 years. The stand is so very open that the soil, which is sandy, has become covered with berries and heath. The forester sells this heath

to the farmers for cattle bedding for an average of $4.83 per acre, sometimes as high as $19.43 per acre, the farmer buying it "on the stump," so to speak, and removing it himself. Then the pine forest is underplanted with oak, Q. rubia being used where the soil is poor, and Q. pedunculata where the soil is good. The underplanting has a magical effect on the thriftiness and rate of height growth of the Scotch pine.

The stands of Scotch pine in the Maasbosch are exactly similar in appearance to the lodgepole in the plateau south of the Chilcotin River. (What our lodgepole needs undoubtedly is thinning and underplanting.)

The Scotspine is sold on the stump for $0.15 per cubic foot on the volume estimated by the forester while the tree is standing, a volume which includes trunk, limbs and leaves no stump. As soon as the timber is cut a new plantation of Scotspine and oak or elm is started.

Damage to Shade Trees

A case of much interest to the property owners of Ontario was recently decided at Omemee, Ont., relating to the rights of property owners in the trees on the highway adjoining their premises. The tree in question was in front of the residence of Mrs. Edward, mother of Mr. Jas. Edward, divisional freight agent of the G. T. R. at Ottawa. A neighbor complained to the town council that the tree had grown so large as to injure the draught of his chimney. The council without investigation ordered one of its employees to trim the tree. Mrs. Edward sued the municipality for damages. The case was heard by Judge McMillan who awarded the plaintiff $15 and costs, by the terms of the Municipal Act, Section 487. The judge contended that ten days' notice should have been given to the plaintiff.

Another instructive case came before the Ottawa Police Magistrate recently. A teamster damaged a city shade tree by wilfully backing his wagon against it. It was one of the first cases of the sort to be heard in Ottawa. The magistrate decided that an example should be made and he sentenced the driver to pay a fine of $5 and $2 costs or one week in jail.

These decisions are interesting to those who are suffering from damage done to trees by corporation employees, linemen and others.

Stringent Administration

It is interesting to study the lengths to which Governments in European countries go in the way of interferring with property rights of the individual for the benefit of the community. In Denmark, for ininstance, the purchase of any forest area, however small, by no means carries the right to administer it in accordance with the plans and desires of the new owner. Until he has been the registered owner of such an area for ten consecutive years, he is not permitted to cut down a tree without authority of the Minister of the Interior. The other day, an owner was fined a considerable amount for having done so in ignorance of the law on the subject. We have much to learn in this West of ours as to what price the individual must pay to promote "the greatest good for the greatest number." And this, we presume, is the object of all administration."—"Farm and Ranch Review" of Calgary.

From a Paper Manufacturer

Secretary Canadian Forestry Assoc.

"I enclose $10 to help along the publication of some of your work in French."

Maine's Appropriation

The state of Maine makes an annual appropriation of $71,400 for forestry work. Of this, $69,400 is expended on fire protection, $1,000 on nurseries and reforestation work, and the balance on investigations and publications.

In Massachusetts, the annual forestry appropriation is $83,000, of which $33,000 is for fire protection, $10,000 for nurseries and reforestation work, and $20,000 for the purchase and maintenance of state forests. The remainder, $20,000, is expended for administration, publications and investigation.

Captain Herchmer Wounded

Captain Lawrence Gerald Herchmer, son of Mr. F. K. Herchmer, district inspector of forest reserves for Manitoba, who is with a battalion of Highlanders from Winnipeg, was wounded on the 29th April, by a compound fracture of the lower jaw. The setting was done on the 4th May and by the 9th he was reported to be out of danger and doing well.

Our Forestry Battalion

So pleased is the War Office with the work of the Forestry battalion under Lt. Col. Alex. Macdougall that Canada has been asked to send two thousand more lumbermen.

The 1,500 men who have gone are engaged in cutting down the forests in Great Britain to supply the shortage of lumber.

The new battalion will be under the command of Lt. Col. J. B. White of Montreal, a director of the Canadian Forestry Association, who is now in England. The organization will be done by Lieut. J. W. Hughson of the firm of Gilmour & Hughson.

The equipment of the Canadian Foresters is so well liked by the British government that it has decided to equip English forestry battalions in a similar manner.

Canadian Timber Values

According to a recent Commerce Report the values of the various classes of timber produced in Canada in 1914, together with the values of the forest products, total $176,672,000, being divided as follows: Lumber, lath and shingles, $67,500,000; fire wood, $60,500,000; pulpwood, $15,500,000; posts and rails, $9,500,000; cross ties, $9,000,000; square timber exported, $400,000; cooperage, $1,900,000; poles, $700,000; logs exported, $850,000; tanning material, $22,000; round mining timbers, $500,000; miscellaneous exports, $300,000; miscellaneous products, $10,000,000.

Prairie Lumber Industry

Although the prairie provinces are usually associated with but one pursuit, namely, farming, the forested portions give rise to a lumbering industry of importance, and, while inferior in development to those of British Columbia or the eastern provinces, are of great value to the immigrant settlement in the west. In 1913 some 188 mills in Manitoba, Saskatchewan and Alberta sawed approximately 250 million feet of lumber, valued at the point of manufacture at over $4,260,000. Of this quantity, Saskatchewan forest produced approximately two-thirds. Alberta one-fifth, and Manitoba the balance. The prairie market consumes about 1,434 million feet of lumber annually. Over one-half of this comes from British Columbia (in part from the Railway Belt portion), and the remainder is supplied from northwestern Ontario, the United States, and the home forests. —Forest protection in Canada, 1913.

How China Pays the Penalty

Photographs taken in desolated parts of China. Top picture shows effects of recent erosion as a result of deforestationabout three miles from Tsa Pu, Wu Tai District, Shansi. Lower picture was taken in the valley of the Sha Ho with the town of Tou-Ping and distant Granite-Gneiss Mountains, Chili Province, China.

China's Policy of Forest Wrecking

Indifferent to the Striking Success of Japan's Korea Possessions in Reforesting Barren Lands

The Hong Kong Weekly Press in printing a detailed notice of Mr. N. Shaw's "Chinese Forest Trees and Timber Supply" says:

"One rises from a perusal of this work with a feeling of positive disgust at the foolish neglect by the Chinese of trees, which is slowly but surely ruining one of the fairest regions in the world. The North-West is gone, and the North is going." Then, almost immediately afterwards, we read, in the review of the annual report on Chosen, an account of what Japan is already doing in her newly-acquired territory, and our disgust is deepened. "With a view to stimulating in the people an interest in or love of afforestation, the government-general, selecting the anniversary of the demise of the First Emperor of Japan as Arbor-day, has caused, since the annexation, a universal plantation to be carried out on that day, the first time being April 3rd, 1911. The first Arbor-day was held under the auspices of the Governor-General in the government grounds on the slopes of Nansan, while the civil governor conducted plantations on a mountain in Keijo on the second and third Arbor-days. Arbor-day arouses much interest in the people in general, especially in the school children. While 4,650,000 trees were planted on the first Arbor-day, over 10,160,000 trees were planted on the second Arbor-day, April 3rd, 1912." Could anything be a greater contrast than the state of things existing, so to speak, next door, where, according to Mr. Bourne, the only effort made in the direction of afforestation is that "Wood is usually planted round graves and is usually cut and sold by a spendthrift son."

These quotations speak sufficiently for themselves, if, indeed, there is any need of demonstrating the desirability of afforestation in China and the possibilities that would lie before any well-designed plan to that end. This being so, why is it that the Chinese, who always have an eye to the main chance, have suffered so valuable an asset as a huge timber supply not merely to be neglected but in many cases to be deliberately destroyed? China's timber crop ought to be a very paying thing, and afforestation and lumbering are industries which are quite within the capabilities of the Chinese themselves. The mining industry is hampered and stifled principally because it is feared that its development would give foreigners too great an influence in the interior, but this argument does not apply to the timber trade, which could be developed to a considerable degree, if not to its fullest extent, by the Chinese themselves. Probably the two principal reasons which prevent anything being done in this direction are lack of roads and the unsettled condition of the country districts. Speaking roughly, all the accessible land in China is cultivated and is under crops which yield a much quicker and, in the long run, a larger return than timber; but if timber has to be grown in the inaccessible spots, how is it to be brought to market without roads of some sort? As a matter of fact, China's only large forests are all in remote places difficult of access, and probably it is to that reason alone that they owe

their existence, though unfortunately the same reason deprives them of the greater part of their usefulness. The timber supply of Hainan Island has hardly been touched yet; the interior of the island abounds in valuable woods, but there is no means of bringing the logs to the coast. The forest belts of South-East Tibet and Western Szechuan, and of the interior of Fokien, can only be turned to account where water communication is handy, and as practically no effort is made to replace the trees that are felled, the indications are that in process of time the wooded area will be driven so far back from the rivers that it will be useless. There are, however, many parts of China that are now absolutely bare where timber could profitably be grown, i.e., along very large stretches of the Kwangtung littoral, where the conditions are identical with those of the New Territory. Referring to these regions, and particularly to the Hakka country, a Kew Bulletin says, "There are few places in the world where good coniferous timber will grow more easily or more quickly than in certain parts of South China." As a matter of fact, pine plantations are often seen in those sections, but the trees rarely attain timber-producing size, or even exceed five or six feet in height. By the time they are big enough for firewood, they suffer from the depredations of the villagers on all sides: it is always found necessary in China to have watchmen to protect growing crops at night, but for a plantation of trees, the services of these men would not be confined to the few days when the crop was ripening, but would be a standing expense until the trees were ready to be thrown. In these circumstances, it is no wonder that hardly any Chinese show practical enthusiasm for the afforestation of their barren hillsides, and we fear that in spite of the excellent example Japan is setting her in Korea, the development of China's potential resources in this respect will not be the fruit of a well-laid design and of concerted measures, but will be evolved gradually pari passu with the advance in other directions, especially in the development of her internal communications and in the greater security of the rural districts.

A Note to a Guide

Dear Tom-o'-Woods, good day to you!
I take a pen to say to you,
I'd like to run away to you—
A city is a jail.
I loathe the walls that block us in,
The foolish rags they frock us in;
I want to wear a moccasin
And feel the mossy trail—

To watch the forest shimmering,
The morning kettle simmering,
To know the flash and glimmering
That dipping paddles make,
To taste the breath of June again,
To hear the calling loon again,
To see the mirrored moon again
Within a dreaming lake.

A brook's clear laugh is haunting me,
A squirrel's chirr is taunting me;
I know the hills are wanting me—
The hills I long to roam.
Then fill a pack or two for me—
Oh, anything will do for me—
And patch the old canoe for me;
Your boy is coming home.

—Arthur Guiterman.

From a Firm of General Merchants

Maple Creek, Sask.

"We enclose renewal subscription for 1916. We know that you are doing a grand work and deserve much stronger support than you are receiving."

Newfoundland's Tragic Timber Losses

Sir Daniel Morris Asserts That Forest Fires in the Colony Cost Over $5,000,000 Yearly

Speaking at a meeting of the Royal Society of Arts in London recently, Sir Daniel Morris said that the timbered areas of Newfoundland were generally found in the valleys of the larger rivers, and on the banks of the lakes and ponds. In many cases they were confined to strips from one to two miles wide. There were about six and a half million acres of wooded lands in the Colony. All the known timbered areas in Newfoundland, except those lying within the three-mile limit of the shore reserved by the government, were held under licence by private parties or by companies. The conditions under which these licences were issued gave the holder the right to cut timber for a term of ninety-nine years on payment of an annual rental of two dollars per square mile. In addition, there was a royalty of fifty cents per M feet B. M. payable on all timber cut on the area, except such as was manufactured into pulp or paper. In the production of sawn or manufactured lumber there were a dozen large mills in Newfoundland, and ten times as many small ones producing cooperage stock, barrels, shingles, and laths. The annual value of the output was estimated at £120,000. In 1906-7 the value of the exports of sawn lumber reached a total of £65,000; but this had since fallen off, due, it was thought, to increasing local requirements. Water power was abundant, and leases were granted by government for terms of years of the right to use the waters of any river for driving machinery, on payment of a rent and subject to a fine of £100 for each offence of introducing sawdust or other deleterious matter into the water.

The spruce lumber was of exceptional quality. It was used locally for general building purposes and for ship and boat building, and in the case of the smaller logs it provided a very superior material for manufacture into paper pulp. A very small proportion of the birch timber was utilised, the principal uses being the construction of the under-water parts of the hulls of cruisers and for wharf piles, as the wood was found to last better than most others under such conditions. It was used for various other purposes, among others, that of the manufacture of furniture.

The smaller timber of Newfoundland was chiefly used for the manufacture of paper pulp, but since the outbreak of the war there had been a considerable export of pitprops to this country. An inquiry had been made by experts into the cost of supplying pitprops to this market, and one of these experts had expressed the opinion that the cost need not exceed that of pitprops coming from the Baltic.

Sir Daniel said that very little seemed to be known in this country about the flora of Newfoundland! no one seemed to have devoted themselves to the subject, and he gave a long list of the forest trees which grow there. Besides the black spruce and the

birch already spoken of, he mentioned among others the white pine, the balsam fir, the tamarack, the sugar maple, the black ash, and the American elm. Several of these, he said, produced valuable woods useful for a variety of purposes. Forest fires were the cause of a loss to the Colony estimated at from £1,000,000 to £2,000,000 annually; they were very largely due to sparks from railway engines. Once an area was cleared, reafforestation took from thirty to fifty years. Jutting out as it did into the Atlantic, Newfoundland was much nearer the Mother Country than most people realised.

In the course of an interesting discussion that followed, Sir William Macgregor, a recent governor of Newfoundland, who presided, said that in addition to the forest reserves in the island itself, there was a considerable area, perhaps 10,000 or 12,000 square miles, in the southern part of Labrador. The trees were practically all of the same kind as in Newfoundland, and there was not so much difference in the rate of growth as might be expected. The Labrador forests did not suffer from fires to the same extent as did those of Newfoundland, and one result of this was a much higher proportion of coniferous trees; for it was found that a fire not only destroyed the standing trees of these species, but it destroyed the seeds also, with the result that the first growth after a fire was not of pine or spruce, but of the less valuable birch. He had read recently that a spark arrester had been invented which was efficient and cheap. The difficulty in the past had been that if the meshes of a spark arrester were sufficently fine to stop sparks, ventilation was stopped also, and it was very difficult to get up the heat necessary to develop steam. As to reafforestation, it was a melancholy fact that the British peoples did not anywhere seem to appreciate its importance.

Lord Northcliffe said that very few people had crossed the island in more than one directio.n Had it been in the hands of the Germans, it would have been long ago exploited.

Mr. Alfred Reed (of the Albert Reed Company) said that in spite of many good points, the native Newfoundlander had one defect—he was extraordinarily deficient in any appreciation of the value of standing timber, and would cut down a large tree to use a very small part of it, although he could get what he wanted from a much smaller tree not far away. Another thing was that it was very difficult to get them to settle down to any kind of industrial labor. The last time he was at the mills he was told by the superintendent that practically every man except the foreman and leading hands had worked, taken his leave, and come back at least three times.

English Forest Areas

Many Canadians who have not visited Great Britain suppose that there is little woodland in the old country, and it is natural to think of the United Kingdom as cleared of timber and cultivated like a garden.

In England and Wales, according to a recent report of the forestry branches of the British Government, there are nearly 2,000,000 acres of forest, and large areas of uncultivated land on which it is the intention to cultivate a growth of timber. There are, it is estimated, 2,500,000 acres of afforestable land in England and Wales.

Of course most of the British forests are held for park and estate purposes. The area of crown forests in England and Wales is only 65,766 acres, made up mostly of the historical estates of the crown.

What is a Forester?

(By Frederick Olmstead, Consulting Forester, San Francisco.)

At the meeting of the Society of American Foresters in San Francisco last October George M. Cornwall, editor of The Timberman, read a paper on "The Forester's Duty Toward Lumbering" and the writer discussed "The Lumberman's Duty Toward Forestry." It seems to me that these two discussions deserve more than passing remark, mainly because of the different points of view advanced by the lumberman and the forester as to what constitutes the duty of the one to the other. Let me state that I do not assume to represent the opinion of all foresters on this subject, nor, perhaps, would Mr. Cornwall care to assume such a responsibility for all lumbermen. Nevertheless, owing to the national character and importance of the meeting before which the papers were read the two divergent views should command more or less attention.

Briefly put, Mr. Cornwal's idea of the forester's duty toward lumbering was that he should specialize in such problems as over-production and under-consumption in the lumber trade; the purchasing power of farm tenants; the replacement of wood by cement and other materials; the utilization of by-products for pulp; the manufacture of wood for paving, excelsior and many other things; the elimination of waste in sawing at the mill; constructive advertising of wood, and the business of distributing and selling forest products.

Work for the Lumbermen.

This is not forestry, nor are the men engaged in such work foresters. I admit that these problems are of vital importance to the lumberman's business and that they should be studied and solved, possibly to a large extent by the lumbermen themselves. I suggest, however, that such problems are not essential parts of the forester's profession and that they may best be attacked and settled by experts other than the forester.

As his name implies, the forester's work is in the forest. He is concerned in measuring the amount, kind, quality and value of growing timber, and in determining and applying methods for its protection; in mapping the land to show how the various bodies of trees are located and how they may best be cut and removed; and, where conditions warrant, in designing and putting into practice such cutting methods as will make present operations profitable while leaving the lands timber-productive. His highest duty and most difficult work is this problem of using a natural resource without destroying it. It is odd, incidentally, that this problem has so far made but a slight impression on the lumberman; he has not only generally overlooked the possible advantage to himself in cases where he intends to hold his logged-off lands, but has also failed to realize that the state, when it begins to acquire for itself lands best suited to tree growth, will acquire first, and pay highest for, those lands which have been kept producing timber, not those which have been turned into non-productive wastes.

Logging and Foresrty.

Mr. Cornwall stated that "a knowledge of logging engineering is the basis of true forestry." I should put it otherwise. Logging engineering is an incident to, not the basis of, true forestry. It is essentially civil and mechanical engineering and has to do, for the most part, with mechanical devices for the transportation of logs to cars and mill. Of this, to be sure, the forester should

have a general knowledge. A part of logging engineering—the determination and detailed analysis of logging units—is true forestry; but a forester can no more pretend to be an expert in civil and mechanical engineering than an engineer can assume to be an expert in forestry. When the forester's plans involve technical details of railroad construction or the installation of logging apparatus nicely suited to given conditions it is manifestly wiser to instrust the practical solution of these matters to men trained in the profession of civil or mechanical engineering.

One who specializes in the advertising of lumber or in problems connected with the distribution and sale of lumber is an advertising or traffic expert or a lumber salesman. He is not a forester. When the forester enters such work he leaves the profession of forestry and adopts advertising or salesmanship as a business. One who specializes in the preservative treatment of wood, or in the mechanical strength of wood, is an expert in chemistry or mechanical engineering. He is not a forester.

Abolish Forest Schools?

I admit that a man trained as a forester can be switched to a capable expert in one or more of the branches of work emphasized by Mr. Cornwall; but I believe it to be a waste of time, money and training to adopt such a course. Experts in lumber economics, wood utilization, wood advertising and wood selling might better be obtained from the ranks of economists, engineers, chemists, advertising specialists and those versed in salesmanship; for the training and experience of the forester is of merely incidental advantage in such matters. The forester has a definite field as a forester in both governmental and private work.

It may be argued that the field for the forester's services as here defined is too limited to employ the large number of men now being ground out each year by the many forest schools of the country and that, as a consequence, the forester must be lead into other callings. There are twenty-two forest schools in the United States which give degrees. The remedy for this state of affairs lies not in training an oversupply of foresters and then shunting them into lines other than their training, but in the abolishment of nineteen of the twenty-two forest schools; for fully that number have no legitimate excuse for existence.

Then again, why should not most of the experts mentioned by Mr. Cornwall be developed from the ranks of the lumbermen themselves? From the nature of their practical training and experience should not lumbermen be well qualified to specialize in these fields? Moreover, if the forester be expected to diagnose the lumber business and become an expert in all its branches from tree to consumer,—what is a lumberman? Has he made the best of his opportunities?

Douglas Fir for Australia

D. E. Hutchins, forester for the British Government in South Africa, and recently transferred to Australia to continue his investigations is of the opinion that Douglas fir can be cultivated on a very extensive scale in both Australia and New Zealand. Mr. Hutchins advocates the cultivation of this tree with a view of reforesting many of the denuded areas in those countries which were once covered with commercial timber. He reports that the Douglas fir is one of the hardiest trees and can survive in the most unfavorable conditions, pointing as an illustration the remarkable growth of self-seeded areas in the Queenstown Park in Queenstown, Australia.

Using Up Ontario's Capital

(*Toronto Globe, June 2, 1916.*)

Some time ago Sir Clifford Sifton, whose opinions are especially valuable because of the information at his command as head of the Conservation Commission , estimated that at the present rate of cutting and burning the forests of Ontario would cease to exist in thirty years. The spruce required for papermaking will, it is hoped, reproduce itself indefinitely under the care of the owners of pulp mills, who will guard their raw material with jealous care, but the white pine areas will be of no value to the people of the Province until reafforested, or, if the land is suitable for tillage, cleared and occupied by settlers.

In permitting the extinction of her forests, Ontario is living upon her capital. They might be so managed as to yield an annual crop of timber in perpetuity by the cutting of mature trees and the leaving of the immature until their full growth is reached. In continental Europe the harvest of the forests is one of the most important sources of wealth, supplying, as it does, the raw material for industries largely located in the forest areas. Ontario has something like two thousand industries that depend on the standing forests of the Province for their raw material. Many of them would cease to exist were they compelled to draw their supplies from the Southern States or the forests of the Pacific slope. Manufacturers who use oak and other hardwood lumber in their business have even now to obtain the bulk of their lumber abroad, although at one time the southwestern area of the Province was covered with a magnificent growth of hardwood.

The Canadian Forestry Association has been trying to convince Ontario that the policy of using up the forest capital of the Province is bad business, but has not succeeded in the degree hoped for. Ontario's system of forest protection is far less effective than that of either Quebec or British Columbia, the two other great timber producing Provinces. In Quebec settlers are not permitted to clear land by the use of fire without first obtaining a permit to do so from a qualified ranger. This obviates largely the ever-present risk of settlers' fires being set out on excessively dry or windy days, and also insures that the heaps of slash shall be kept in the centre of the clearing. Quebec is also awake in its efforts to make incendiarism in forest areas punishable to the same degree as fires in a town or village. Under Quebec laws several scores of prosecutions of settlers who caused forest fires last year were undertaken. In many cases fines were imposed, and in some instances reckless offenders were sent to prison. British Columbia's contribution to forest conservation is a modern and energetic forest protective service. The rangers have already greatly lessened the risk of wholesale losses from forest fires. The men of the forest service do much to educate the local residents in the use of safety devices. They build trails and lookout towers, construct safe camp fireplaces for hunters, fishermen and campers, and are ever on the watch against the carelessness of the inexperienced settler.

Ontario requires the reorganization of the fire-ranging service so that adequate supervision and inspection shall be secured. An application of the Quebec permit system to the clearing of land is needed also. The regulation works no hardship to the settler and insures the advice and supervision of the ranger when clearing fires are con-

sidered desirable. The Province gets much of its revenues from the forests. Would it not be sound public policy to energize and bring up to date the forest protection service, which at present does not yield an adequate return for the amount expended upon it? Are reforms in forest administration to be deferred till there are no forests to guard?

Big Timber Deal

What is stated to be one of the largest timber deals ever put through in British Columbia occurred recently, when W. A. Anstie, managing director of the Forest Mills of British Columbia, acquired from the Arrow Lakes Sawmill Company their entire holdings of ovre one billion feet of standing timber and their big sawmill and plant at Arrowhead. It is reported that with the acquisition of this property the Forest Mills Company became the largest owners of timber and have the largest manufacturing capacity in the province. During April the Alberni Pacific Lumber Company shipped 116 cars of lumber to points in the East.

Silk From Sawdust

Making artificial silk from sawdust and other lumber waste is the latest experiment of the United States Forest Products Laboratory at Madison, Wis. The use of artificial silk made directly from wood is increasing by leaps and bounds. Originally its principal use was in the manufacture of braids and trimmings, but recently the manufacture of hose from artificial silk has become an industry of importance. Other uses for artificial silk are woven goods of all kinds, linings, tapestries, etc., neckties, ribbons, sweater coats, etc. About five and one-half million pounds of artificial silk are used annually in the United States.

From Hon. W. R. Ross, Minister of Lands, Province of British Columbia.

Victoria, May 12, 1916.

"From the time it was first organized, the Canadian Forestry Association has assisted effectively in the advancement of forestry in British Columbia, as undoubtedly it has all over Canada. Especially at the present time, in view of war conditions and the need of husbanding carefully all Canada's resources, I feel that the association has the opportunity to be of service. Educational work, such as that which has produced such good results in fire prevention should be extended to other forest problems, such as the development of the export trade in lumber and paper, the encouragement of the use throughout the Dominion of Canadian forest products, the planting of trees on the prairie farms, and the use and care of farm wood lots. Forestry, after all, is simply one form of agriculture, to which, on account of conditions of climate and soil that cannot be changed, the greater portion of Canada must always be devoted. Owing to various circumstances, forestry is also the most backward and unorganized of all the great sources of production.

"The place forestry must occupy in Canadian life is, however, gradually coming to be recognized by the thinking men of the country and the present is the most propitious time to enlarge the activities of the association. I am sure that you will find that business and professional men are in accord with the plans of the association and that they will co-operate and assist you in every way possible."

The 1916 Fire Situation

According to available reports the season of 1916 in respect to likelihood of fire losses is so far favorable. Precipitation has been heavy in most sections and few serious fires have been reported. New Brunswick reports some losses. The information thus far received from the prairie provinces does not indicate serious trouble. British Columbia's report, printed below, contains a hopeful forecast for 1916. In the 12,000 square miles patrolled by the Lower Ottawa Forest Protective Association nine fires have broken out, one of them a settler's fire, burning 200 acres. The rainfall, while abnormally heavy in Ontario and Quebec as a whole, is said to be no more than normal in some of the forested sections, where a few hot days have caused serious lamage.

Fire Outlook at Coast

Victoria, B. C., May 15.—Advices to the Minister of Lands from the southern interior of the province mark the beginning of the fire season, small fires being reported from the Cranbrook, Nelson and Vernon forest districts. In the first-named district the late spring is retarding the growth of vegetation so essential as a check upon fires running along the ground and burning the carpet of pine needles, twigs, dry leaves, etc. A hot and dry wind from the south is drying up the vegetation in the Okanagan and Similkameen districts, while hot weather prevails throughout the Vernon district generally. Farmers and settlers are reminded that permits are required for all fires set from the beginning of May, for which application should be made to the local fire wardens. Campers, sportsmen and travellers are urged to exercise every care in extinguishing camp fires, and the co-operation of all sections of the community is desired in order that damage to property may be avoided.

It is worthy of mention that in 1915, 305 fires out of a total of 1031 outbreaks, were traced to campers and travellers, while 267 were caused by land clearing operations. Damage by fires to the timber in 1915 amounted to $109,000, and other property, viz., logging equipment, farm houses and buildings, etc., $58,000. The majority of all fires in 1915 were, as usual, due to human agency, and were, therefore, preventable. Particularly this season, when the Empire is engaged in a vast and wealth-destroying war on a scale hitherto unthought of, it is the duty of every citizen to assist in preserving all resources from avoidable destruction.

Fires Near Prince Rupert

(Prince Rupert News)

The bush fires which have been raging along the line of the G. T. P. for the past few days still continue and the company has had a strenuous time in saving several of their stations from being wiped out. Special trains of fire fighters were sent from various points to help the men of the forestry department in fighting the flames. It was discovered last night that fire had wiped out the bridge on this side of Lake Kathlyn and a special party of bridge men was rushed from Prince Rupert. It is expected that they will have the bridge rebuilt today in time to allow of the passenger train from the east getting through.

New Brunswick Fires

St. John, N. B., May 20.—The serious nature of the forest fires which had been raging in the vicinity of the city during the early part of the week has been determined now that the fires have been quenched by the rains, and a survey of the burned ground has been made possible. Definite information as to the cause of these fires is lacking, but it is stated positively, in at least two of the cases that they had their origin through negligence on the part of fishermen.

The fires in the vicinity of Welsford were the most serious. There were three conflagrations, all of large proportions, and for a time matters looked very serious. The worst one was between Welsford and Clarendon. It started about noon last Sunday, and as everything was dry spread with much rapidity. Part of the area burned had been cut last year and the tree tops, which had been piled up in that district, afforded great facilities for the spread of the blaze. In one case the fire reached a point about half a mile from the railway track, and on Tuesday night forty men went up from Welsford, but it was impossible for them to do anything to stay the progress of the flames. Some lumber camps, owned by Hugh McDonald, which were used during the past winter, were destroyed.

Another fire was raging in the Gaspereaux district; another in the vicinity of Olinville, and yet another near Fowler's Corner. These blazes at times assumed serious proportions. There is no doubt but that for the heavy rainfall all these fires would have assumed enormous proportions, but it is now reported that they have been quenched and that the danger is over.

The fire at Black River is also reported as about finished, the heavy rains having put a check to its further progress.

So far as can be learned there was no damage beyond the loss of the lumber camps and the destruction of the trees, but the loss in timber will, in itself, be no light one.

Forest Fires and Reforestation

The following resolution introduced by Prof. P. S. Lovejoy, of the University of Michigan, was adopted by unanimous vote at the Spring Meeting of the Technical Association of the Pulp and Paper Industry, held at Kalamazoo, Mich., May 11, 1916, and the secretary was instructed to send copies of it to the various state forestry associations, the governors of states and the press generally:

Since wood is an essential raw material of the pulp and paper industry, and

Since the supply of timber suitable for pulp manufacture is rapidly decreasing and its cost is rapidly increasing, and

Since there are great areas of non-agricultural lands in the lake states, which lands once produced splendid timber, but are now practically barren as the result of lumbering and repeated fires,

We therefore urge that the pulp-producing states take immediate action.

(1) Looking toward the better protection of these non-agricultural lands from fire.

(2) Looking toward the restocking of such lands where necessary by planting.

Toronto Weekly Sun on "Forestry and War"

We have heard a good deal about the shortage in horses, meats and wool which will exist during and after the war and a lot of more or less valuable advice to farmers has been based on conditions alleged to exist in regard to these matters. But there is one natural product the supply of which has been shortened by war by a much greater extent than

is the case in any line of live stock and concerning which very little is being used. This product is timber.

In no one direction has destruction, due to war, been so great as in forest growth; in no other direction will the work of repairing loss be so slow after the restoration of peace. Live stock, household goods and merchandise can be moved out of the way of an invading army. Forests have to be left to take whatever war brings in its train. Over large areas in France, Serbia, East Prussia, Austria and Russia hostile armies have already passed; over still larger areas other hostile armies will pass ere the war ends. And wherever artillery comes into action in a serious way forests which stand in the line of fire are blasted as by a cyclone. In addition to the destruction caused by artillery there have been and will be vast quantities of timber used as supports in the trenches with which a large part of mid-Europe is being seamed. Unless peace comes soon considerable areas in Continental Europe bid fair to become a treeless land. Even in England forests that have stood for centuries are being sacrificed largely to meet war demands in construction work.

Before the war began the world's forest reserves were insufficient for world needs. The shortage will be greater after the war ends and that shortage cannot be made good over night. Wrecked buildings can be replaced in a few weeks; a new crop of hogs can be matured in a year; beef can be brought to maturity in two years. But it takes a generation to create a merchantable tree. **One of the first needs in reconstruction after the war, in so far as this Province is concerned, will be a well-devised forestry policy. Such was needed before the war; it will be still more necessary when the present work of destruction ends.**

Carrying Cost of Timber

E. T. Allen, forester of the Western Forestry and Conservation Association, representing 13,000,000 acres of standing timber, presented the case of the timber owners to the Federal Trade Commissioner at Washington, D. C., on March 14th. Mr. Allen contended that unless conditions improved timber owners would be unwilling to carry their holdings. He declared that only a general reorganization of the entire industry could save the situation. Elimination of profits of too many middlemen was suggested by Mr. Allen. Timber owners, he contended, have given up all idea of holding timber for speculative purposes. The increased carrying costs are mounting faster than stumpage values. Mr. Allen contended that the carrying of raw material for the lumber industry has become a project of such vast magnitude and difficulty that it is a great factor in the situation and must receive equal consideration with manufacturing problems.

From "Canada Lumberman"

"The Canadian Forestry Association hit upon a very clever means of popularizing the work of forest conservation when it decided to present a Boy Scout Forest Book to each of the sixteen thousand boy scouts in Canada as part of its educational propaganda for forest protection. In the thirty-two pages of text and illustration the boy is introduced to the Canadian forest in a way that is bound to arouse his interest therein as a personal and national necessity, and give a new turn to the study of woodcraft that is part of every boy scout's training. The sound business reasons for putting an end to our annual plague of forest fires are presented in convincing fashion."

Stopping Fires By Publicity

Are Canadian Lumbermen Utilizing Modern Educational Weapons As Their Own Financial Interests Demand?

The use of publicity in the building up of forest protection sentiment has been employed only to the minimum degree by the lumbermen of Canada. Inspired by the excellent results achieved by the Western Forestry and Conservation Association of the United States, the British Columbia Forest Service and some commercial firms have gripped the idea and set it to work. So satisfactory and promising have been the results of popular education in forest guarding as to justify an extension to every forested province of the Dominion. Quebec, particularly within the zone of the co-operative associations, has accomplished something in the distribution of educative literature and the carrying out of a personal propaganda by the precept and example of the fire rangers.

The adherence of all wide-awake lumbermen to the needs of vigorous mutual and governmental action in the cause of forest protection against fire is growing at a rapid rate. Limit holders who a few years ago shook their heads at the thought of employing protective devices other than natural rainfalls, have quit their old-fashioned position and lined up with the "moderns." The first experimental years of the St. Maurice and Lower Ottawa co-operative associations in Quebec have helped greatly in a general conversion. Actual saving of timber has become an accomplished fact. Old-time losses have been cut to fractions. Statistical proof has been produced not only in Quebec and British Columbia but from many parts of the United States, where brains have been given a chance to demonstrate the folly of tolerating wholesale fire damage in timber areas. No longer need the progressive lumberman point to results accomplished in Europe; he has results at his own door. No longer have the provincial and federal administrations the excuse that forest fires are a necessary evil peculiarly associated with the Canadian timberlands. Facts have shown this to be false ground, and have also shown that whenever any of our government forest departments care to institute genuine forest protection, they need not step beyond the borders of the Dominion to find how it should be done.

The immediate causes of forest fires differ somewhat with the locality. Settlers' clearing operations cause enormous losses in one district, and in another the railway, sportsman, river-driver, prospector, may equally share the onus of damage. Nearly always, however, human hands and human heads must bear the responsibility.

Fires Mostly Accidental

Laws that promise punishment will do much in curbing some classes of incendiarists, but it must be remembered that nearly all forest fires are, in the main sense, accidental. Few settlers *deliberately* burn the timber of the limit holder, although their carelessness is almost as guilty. Few campers *deliberately* desire to destroy the haunts of a thousand other campers; so with the river-drivers and the prospector and the others.

This lack of deliberateness in the setting of dangerous fires in forest

areas supplies the reason why all who have standing timber exposed to risk or who have the more remote interest of a lumber yard or a furniture factory should get acquainted with and stand behind any organized Canadian effort to fight forest fires by education. The goodwill of an informed public is worth all the forest laws ever written.

"This is not conjecture," said the National Conservation Congress at Washington, D. C. "Progress differs locally almost exactly with the degree in which propaganda has been successful."

The limit-holders of the Western States agree to such a pronouncement; they back it up to the tune of from $200,000 to $300,000 a year. There is not more than a trifling fraction of such an amount spent on educative work by the lumbermen of Canada, outside of the two co-operative associations in Quebec, but the plentiful indications of an awakening to the needs of the situation are most encouraging.

Work Gets Its Reward.

The work of bringing the masses of the Canadian people into intimate touch with the forests and forest industries of the country is mainly in the hands of the Canadian Forestry Association. Without any governmental or other affiliation, this association, composed of public-spirited Canadian citizens (now numbering over 3,700) has waged a campaign for seventeen years. The hard labor expended in the long discouraging period when conservation was a dictionary term is bearing fruit. Even in the past two years of war heavy additions to the membership and a wide extension of the association's activities have been carried out.

Three-fourths of the day-to-day energies of the association are expended on forest fire prevention through winning public co-operation. Experience in the United States, and to a considerable extent in British Columbia and Quebec, has plainly proved that skilful and persistent education must travel hand in hand with lookout towers, trails, telephone lines and rangers. How the educative portion of the work is carried out by the Canadian Forestry Association may be briefly indicated.

Practically all newspapers in Canada, daily, weekly, commercial, religious, etc., give the association the fullest assistance in spreading information about the importance of the wood-using industries and the need of guarding their supplies. Hundreds of articles, many illustrated, are prepared and placed. Newspaper cartoons, putting a sermon in a nutshell, are placed with about three hundred papers twice a month. Co-operation is also given to public and private forest agencies in getting important news to the newspapers and magazines, such as prosecutions of settlers, changes in regulations, etc.

Illustrated lectures under the auspices of public societies are given in many parts of Canada. Motion picture theatres are freely utilized to show special fire cartoons between the reels. "Ready-prepared" lantern lectures are sent to ministers, teachers, etc., who have facilities for gathering audiences.

The Printed Word.

One of the most fruitful activities in which the Canadian Forestry Association is engaged is the encouragement of Boards of Trade, Municipal Councils, clubs and societies to take an interest in the forest conditions of their localities and to bring pressure to bear upon provincial and federal authorities for needed reforms in administration or in laws.

The influence of the printed word was never so definite and real as today. The association makes use of print and illustration to an extent limited only by its finances. During the past seven months fifteen thousand copies of "The Boy Scout's Forest Book" were placed in the hands of school boys and girls and their

elders. Colored instructive pamphlets were issued in French and English to the extent of about thirty-five thousand. Twenty-five thousand copies of "A Matter of Opinion," a propagandist novelty of 24 pages, and fifteen thousand copies of "Your Enemy's Photograph" in two languages, have gone through the country. The banks, railways, forest departments and private corporations undertake to give all these issues very careful distribution to settlers, railwaymen, riverdrivers, campers, etc., etc., from coast to coast. The association also maintains "The Canadian Forestry Journal," which has been found of marked value educationally. The foregoing are some of the more tangible concerns to which the attention and revenues of the association are directed.

It will be noted that in no department of its work is the association taking up cudgels for anything but the most practical and proved methods of forest preservation through the sure channel of education.

(Article reproduced from "Canada Lumberman")

How to Prune Your Trees

Always use a pole saw and pole shears on the tips of long branches, and use the pole hook in removing dead branches of the ailanthus and other brittle trees where it would be too dangerous to reach them otherwise.

Do not "head back" or cut off the top of a tree except where the tree is old and failing, and then under special instructions.

Be as sparing and as judicious in pruning as possible, and do not raise the branches so hikh as to make the tree look like a telegraph pole.

Commerce pruning the tree from the top and finish at the bottom.

Make every cut as close and parallel to the trunk as possible.

To make the cut perfectly smooth the saw must be well set and sharp.

Leave nō stubs, dead and dying wood, or fungus-covered branches behind you.

Do not fail to cover every wound with coal tar, not allowing it needlessly to run down the trunk.

Do not remove several large branches on one tree at a time. They must be removed gradually, the work extending over several seasons.

The Forests of Paradise

The following quaint expression by one of his friends of the views of the future felt to be those of M. Desjobert, the old and respected forester of the forest of Troncais, who has recently died in Franc, will find an echo in the hearts of other foresters for what it anticipates both in the presence and in the absence of some of the things that go to make up the forester's life in this world.

"A fervent and consecrated Christian, Desjobert was not one of those who see death approach with terror. I have always thought that in the face of eternity he imagined Paradise like a great forest of Troncais, more magnificent certainly, more spacious, an ideal forest where the wind of politics does not blow and which is lighted by a great sun of justice.'

Prevent tearing the bark off the trunk in removing large limbs by first making an "undercut."

Make the cuts on a slant. Some trees, like the elm, sycamore, linden and willow will stand the process of heading back more than others, and the poplar is a tree that must be cut back every few years to keep its crown from becoming too tall and unsafe.

When shortening a branch, leave a few twigs at the end to draw the sap to the freshly cut wound and thus enable the growing layer under the bark to heal it over.

In trimming small branches or shoots, the cut must be made just above a bud.

When several branches come out from the trunk in a whorl, they should not all be cut away at the same time lest the tree be girdled. This arrangement of branches occurs most frequently in the coniferous trees.—American Forestry.

Ship Shape Raft for Lumber Cargoes

A novel method of getting needed timber and lumber overseas without using up shipping so urgently needed for other purposes, has been enunciated by Captain A. G. Midford, of Ottawa. His plan, in brief, is to tow it across in the form of huge timber rafts, and he states that from one to twenty million feet of timber can be taken over at once. His suggestion has received commendation both in Canada and in Great Britain and it is probable that the suggestion may be productive of practical results.

The Timber Trades Journal, a well-known British publication, refers to the suggestion as follows:

Scarcity of Tonnage.

"The difficulty of all nations, belligerent and neutral, is the scarcity of tonnage. Although this is in a great part due to the large number of mercantile ships engaged in carrying supplies for war purposes, so great must be the wastage that, notwithstanding the releasing of a large amount of tonnage at the close of hostilities and the continued building of new vessels, ships will be in greater demand after the war than now.

"The best way to economize in the matter of ships is to do without them altogether, and though this is impossible, at least at present, for the transport of certain classes of goods from overseas, we are pleased to hear that as regards the transport of timber it is not only possible but likely to be brought about by sheer necessity. We have been favored with a copy of a letter received by the Timber Trade Federation from A. G. Midford, of Ottawa, a civil engineer, who has had a life of experience in executing maritime work of magnitude and in solving maritime problems. He also holds a master's certificate and is well known throughout Canada, the United States and South America. This gentleman, we understand, has shown certain plans for the transport overseas of wood goods to Senator Edwards, of the well-known Edwards Lumber Company, who describes Captain Midford's project as an inviting one and deserving of consideration.

Ship Shape Raft.

"Captain Midford's object is to construct the ship-shape raft of timber and lumber in such a manner as to provide against the incessant and usual strain to which any floating body or ship is exposed and must encounter and in meeting the vicissitudes of a stormy sea. According to Captain Midford, the ship-shaped

GETTING ON

While the losses of members in many Canadian societies have been heavy during 1915 and 1916, the Canadian Forestry Association is moving steadily forward.

GIVE THE ASSOCIATION A HELPING HAND TO PASS THE 4,000 MARK BEFORE MIDSUMMER.

This will be difficult unless several hundred members clip out the attached coupon NOW and fill in a name of a friend.

You need send no money until September next and then only a dollar bill. There is no strict prohibition of course against enclosing the dollar with the application.

Just suit yourself.

The new member will receive twelve issues of the Canadian Forestry Journal, and eight or ten small illustrated books dealing with forest protection.

Here is the coupon. Start at it now.

Secretary, Canadian Forestry Association,
Booth Building, Ottawa.

Make the following a member of the Canadian Forestry Association. In September, 1916, the annual fee of

a dollar will be paid by {him / me}

.....

.....

.....

raft is built entirely of mercantile and marketable lumber and timber, is in no sense water-tight and therefore depends entirely upon buoyancy and not displacement in the ordinary acceptance of the technical meaning. The ever-changing strain which must prevail is provided for, without which any floating body would go to pieces in any storm. The midship section is decidedly ellipsoid, the deck being turtle back for economic reasons readily apparent to the competent ship designer or marine architect who will give due consideration to the problem.

Towing Problem.

"Towing has been fully considered, including the cause and prevention of the snapping of the tow-line and the ship-raft will be steered from the after-deck of the towing vessel. Sea rafts of the type suggested may be made up entirely of marketable timber and lumber, and no lumber need be cut or bored for constructive purposes. The entire outside layer could be composed of slabs which have no marketable value in Canada, but would be useful here.

"This is an outline of Captain Midford's project. If he can make it successful he will be doing a service to humanity, for the ships can thus be relieved of wood cargoes for more pressing services."

Captain Midford is taking up his suggestion with the authorities in Canada.

The Taxpayer's Soliloquy

Reprinted from "A Matter of Opinion" a Booklet Issued by the Association.

"I never knew how much red blood there is in Figures until the Council made me Chairman of the Finance Committee down at the City Hall. When a fellow realizes, as I soon did, that every dollar in the local treasury rings a bell in the taxpayer's pocket, he gets an uncanny feeling that tax money belongs to a different tribe from any other money.

"Last winter I spent a week on the borders of the Temagami Forest Reserve in North Ontario. Two miles from the village a lumber firm were taking out pine logs for their mills in Quebec. I said to the woods superintendent one day: "This business looks like easy money; Nature does all the work and you step in and lift the crop." And then I began telling him about the hard time I had, running a Finance Committee in a city of fifteen thousand.

"You don't know how much harder it would be," he replied, "if this forest-crop was left unharvested a few years."

"What difference would that make?"

"You are a taxpayer?" I nodded.

"And provincial administration is not paid for direct by municipalities, but by special revenues."

"Quite true."

"Did you know that the Ontario government takes from $1,500,000 to $2,500,000 tolls from the timber every year?"

"I certainly never heard of that."

"And that British Columbia gets $2,300,000 and over from her lumbermen?"

"Sounds impossible."

"While Quebec is made richer by about $1,500,000 a year from the same source—the timber."

Bovril develops big reserves of strength

When Sir Ernest Shackleton was selecting extract of beef for his Antarctic expedition he said:

"IT MUST BE BOVRIL"

His knowledge of plain facts had me at a disadvantage.

"New Brunswick collects a cool half million and more"—

"That much?"

"With about $400,000 coming to the Dominion Government from Crown forests on the prairies.' '

He must have noticed my growing interest.

"If the forests were not developed by lumber and plup and paper mills, all that money—seven and a half millions a year—would have to be collected from taxpayers direct."

The New Idea.

I assure you I went home with the germ of a new idea in my head. For years I had put aside the forests as the property of wealthy corporations. I thought the governments had 'given away' all the country's timber. I was satisfied that the general public had no concern what happened to the big storehouse of wood supplies. Did you ever think that way?

Promptly I set to work to learn the truth about these forests of ours, who owned them, who got the money. Now—

No lumberman gets a dollar bill out of a felled tree until he has spent three other dollars for labor and supplies. That is, the workman, together with the food, clothing, hardware and other manufacturers and dealers have three shares in the profits to the lumberman's one. If the

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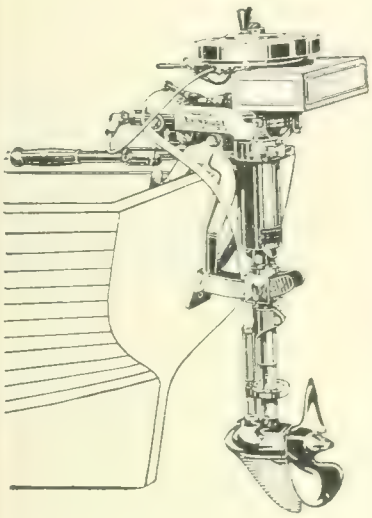

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Very efficient for towing heavy loads.

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In addition to the 2 H.P. and 3½ H.P. models offered heretofore, which are of the 1-cylinder, 2-cycle type, a new model is being placed on the market. This new model is of the 2-cylinder, 4-cycle type and develops fully 4 H.P. It has been especially designed for speed, giving easily from 8 to 9 miles an hour, with an ordinary boat. All the conveniences and safeguards which distinguished the 1915 models will be found in the new 1916 EVINRUDE Speed Motor.

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man working the limits does not first advance the worker and the supply-man their part of the cash, the woods operations come to a standstill and the whole investment may be thrown away.

Look this over! $40,000,000 a year are paid out in wages in the making of timber and its manufacture.

Investors have backed Canadian forest industries with over $260,000,000 of capital.

One hundred and ten thousand men get their livelihood from **living** forests. A Dead Forest means a Dead Paysheet.

Where do these men live? One hundred and fifty of them and their families are in my own little town. Have you seen our cooperage and box mill, the boat works and the saw mill? There are 3500 of them on the paylist of a single firm in Ottawa during an average season. Look over your own town. See what would happen if wood supplies suddenly ceased. Count the mills and

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Enjoy the famous 800 mile Niagara to the Sea trip through America's greatest and most interesting vacation water way.

The service on our palatial steamers is unexcelled, leaving Niagara Falls or Toronto for Kingston, Thousand Islands ports—through the St. Lawrence Rapids to Montreal, quaint old Quebec, Murray Bay, Tadousac and the famous Saguenay River. Trip may be started at any point. Stopovers allowed en route. Every minute full of enjoyment.

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or any Ticket Agent

the workmen affected. Figure out what wood means to you as fuel, lumber, furniture, railway ties, boats, boxes, flooring, paper—I cannot begin to count the jobs that a tree performs in an average town.

Real Patriotism.

You agree with me that Canada must keep the smoke in every possible factory chimney during the next five years. To do that we have got to keep smoke **out of** the timber lands.

A fine lot of business managers! Pointing with pride to 5,000 wood-using factories, and shrugging our shoulders when the Fire-Thief threatens to blot out their sole stock of raw materials.

I am no alarmist, but every lumberman, explorer, forest engineer I have met assures me that this carnival of forest fires cannot **continue.** They say, and I believe, that fires have been cutting down our reserve stock at a rate that brings us today fact to face with a crisis. Think you we can burn this candle of precious resources at both ends—use up millions of trees yearly for lumber and pulp and other manufacturers, and toss even more millions to the flames? Which end had we better retain, the end of Use-and-Profit, or the end of Fire-and-Waste? We cannot keep both. One must **go.**

Those statistics about the wood-using industries make out a case for a Strong Concern, don't they? But the strength, by friend, is likewise the weakness. The foundation of living forests is helpless against fire. They cannot protect themselves. It is up to you and me.

What would you think if we gradually killed off the cattle that bring Canada $37,000,000 worth of butter and cheese every year?

Forest fires threaten to kill wood industries that give us today more than five times the value of all our butter and cheese.

HANDBOOK OF TREES OF THE NORTHERN STATES AND CANADA

By Romeyn B. Hough.

Is photo-descriptive of the leaves, fruits, barks, branchlets, etc., and shows them all with the vividness of reality. Natural sizes ingeniously indicated. Distributions shown by maps. Wood-structures by photo-micrographs.

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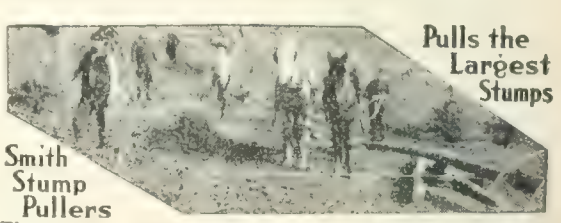

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What would you think of flooding the mines of Canada and turning the workmen adrift?

Forest fires are burning out the mainstay of industries pouring forth $54,000,000 a year in excess of all our mines.

A Job for the Reader.

What, then, can a taxpayer do?

Incorporate this forest protection business as an immediate personal interest.

Don't let your own hands ever become responsible for setting a forest in flames.

Examine your provincial and federal forest guarding systems. Are they dealing squarely with the country's priceless forests? Most of them surely are not. Inform your local members of the legislature and Commons that you are a Conservationist, that you demand progressive forest administration.

Tell them you believe in a ranger staff of competent men, thoroughly supervised in their field work—and tell them you do **not** believe in turning over the vast trust of forest wealth to a batch of appointees, having no permanence in their jobs, badly inspected and rendering second-class service. Tell them the forests of Canada belong to 1988 as much as to 1916 or 1853.

Rest assured, you speak the only argument worthy of a patriot.

Mr. Jean J. Guay, a 1913 graduate of Laval Forest School and for some time attached to the Quebec forest service, is meeting with success as assistant to Mr. W. F. V. Atkinson, Chief Forester of the Spanish River Pulp and Paper Company. Mr. Guay is stationed at Sault Ste. Marie.

P. L. BUTTRICK
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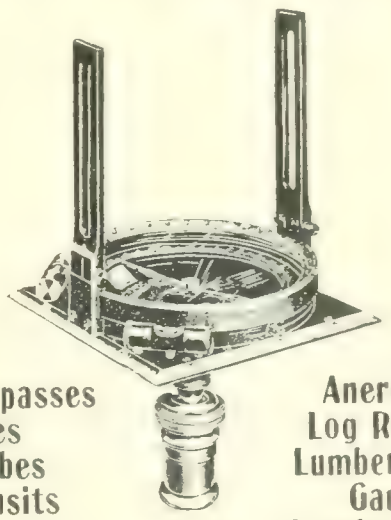

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The Ottawa Citizen recently had the following to say regarding Ontario's system of forest protection.

"The Ontario forest protection system has been practically unchanged in design for twenty or thirty years. Progressive steps taken by British Columbia's forest service and by the Quebec department of forests have not influenced Ontario thus far to supplant a scheme which experience has proved both extravagant and inefficient. Recently the boards of trade of Ontario have taken up the question of reorganizing the protective system and have addressed emphatic suggestions to the Minister of Lands and Forests.

"The contention of forest conservationists is that Ontario's neglect of annual forest fire losses will ultimately force nearly two thousand wood-using industries of the province into serious difficulties; will raise the price of wood products to the consummer; will badly damage the flow of important streams; injure the fertility of agricultural land, and turn thousands of acres into irretrievable barrens. Indeed, these results are already being reaped by Ontario to an extent which few citizens would credit. That the past history of forest management has been one of neglect and bad judgment is the view of these experts.

"Ontario appears to have enough rangers employed, about 500, to give reasonably good service in fire patrol. The chief weakness is the absence of real supervision and inspection. Experience in forest protection has proved that unskilled, uninstructed rangers are of small use in guarding expanses of valuable forest from fire. No branch of employment demands more energy and strict attention to duty. There may be to-day many excellent men in Ontario's forest service, but it is grossly unfair to the worthy men and unwise to the other kind to

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hand out an instruction book at the beginning of a season and let the individual shift for himself. Inspection and supervision must be continuous and close to bring the best results out of any body of men whether in a foundry or a forest.

"The problem of Ontario's forests surely demands prompt and intelligent treatment. Two thousand wood-using industries depend upon living forests for their raw materials. The power value of scores of streams has been badly affected by the burning of tree growth on watersheds. It would seem far more practical and sensible, even as a war measure, to guard the foundations of industry and water powers from needless racking by fire, than to spend time and money on some of the more superficial concerns of the people. One-third of a cent per acre has been demonstrated by the Quebec limit-holders' associations as sufficient to cover the cost of forest guarding. This includes the building of permanent equipment, such as telephone lines, lookout towers, rangers' cabins, and other essentials, of which Ontario has very little. If real protection of magnificent spruce and pine can be obtained for a third of a cent per acre, the losses resignedly borne by Ontario year by year would seem absolutely inexcusable."

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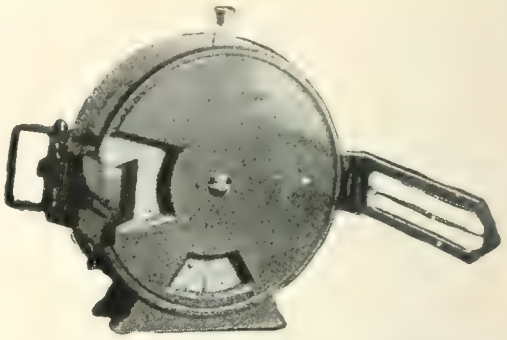

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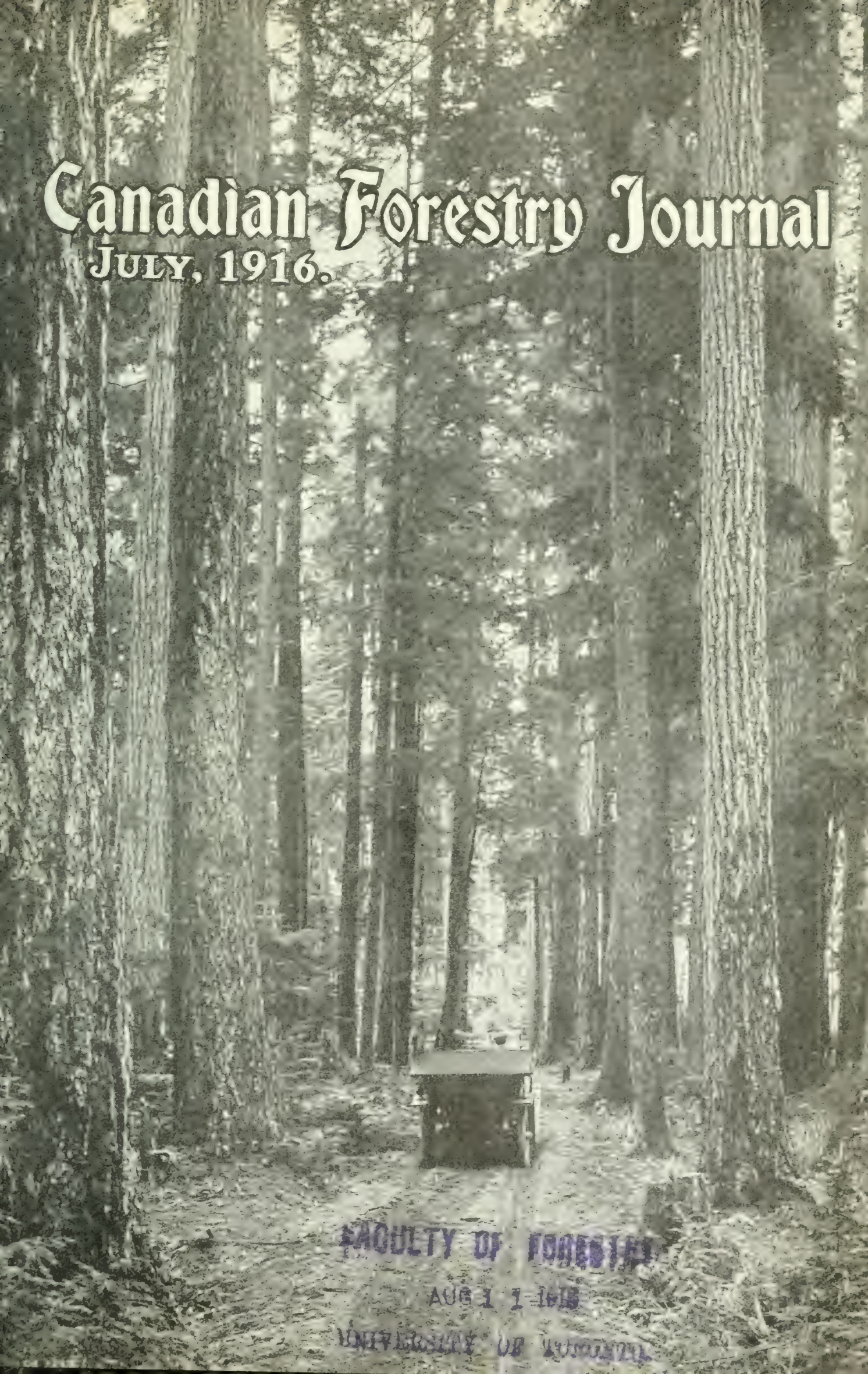

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VOL. XII

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The Forest Resources of Serbia

Great Development Promised in Near Future When Railways and Cableways Overcome Handicaps on Driving.

Without taking into consideration her great agricultural and mineral resources, Serbia would still be a very rich country, merely through the possession of her forests. Hitherto this forest wealth has been little utilized, owing to the lack of communication between the forest areas and the sea, although the actual distance is comparatively short. The reason for this lack of development is due to the very rugged topography of the country which makes road construction very difficult and expensive. However, the country owes its forest resources in a great measure to this same fact, for doubtless if the early Egyptians, Syrians, Greeks, Carthaginians, Romans, Byzantians and Venetians, with their immense demand for ship building and construction material, had been able to reach the forests of Serbia, they would have stripped the mountains bare with the same recklessness as they did those of Greece, Asia Minor, Spain and Italy, whose bald mountains and hills to this very day speak eloquently of the depredations of those early peoples.

Apart from its later acquired territory, says a writer in "The Timberman," the old kingdom of Serbia, possessed only two channels for the export of timber: the broad but very shallow Morava in the interior and the Drina, which forms the Austro-Serbian boundary. Both of these rivers flow into the Danube. Only upon these rivers would it have been possible to drive the timber cut in the mountains. But the Danube flows as the Austrian says, "the wrong way." It leads from the central point of demand in the interior of Europe to the Balkan states. Countries such as Bulgaria, Roumania and southern Russia have at their disposal extensive forests close at hand while Asiatic Turkey, up to this time has had little use for lumber. The streams which flow through Central Europe, the Bug, the Weischsel, the Warthe and the Memel, carry large quantities of timber down stream, while operators along the Danube are handicapped by an upstream tow, and its attendant high freight charges. It is therefore easy to understand why Serbia has played no great role in the exportation of timber and forest products and up to this time has cut only such material as is required for domestic consumption.

The government began some years ago to requisition small amounts of firewood and ties for railroad construction in Moravatale, near Kruschenwatz. In the valleys and heights of the Tarage Mountains, working up to an elevation of 2,000 feet, on the tributaries of the Drina, the Traders' Bank of Belgrade has carried on considerable logging activities with home capital. The bank undertook building operations and erected a mirror factory as well as a large sawmill in Belgrade, where the logs coming down the Drina and Danube are cut for the domestic needs of the country. Prior to the war, a large part of the output of this mill was box material, which the export trade of Serbia required for the shipment of agricultural products.

There has been no great activity in the lumber industry in the newly acquired parts of Serbia. The development of those regions has been hindered for decades, by the uncertainty of the political conditions in the Balkans, which has not been removed by the passing of these territories into the kingdom of Serbia. As a consequence of which foreign capital could be raised only for the exploitation of the rich mineral resources such as copper, manganese and gold. Such capital as did enter Serbia in recent years came chiefly from France.

The forests of Serbia are for the most part, virgin stands of mixed species. The varieties are seldom found in pure growths. The lower elevations are for the most part covered with white beech, while the finest fir and pine stands are found at considerable altitudes. It is lamentable that the lower part of the trunks are in many instances ruined by a practice of the shepherds, which has been carried on since the history of man. This consists of building fires on the lee side of the pine trees directly against the trunks. The flow of resin which exudes from the tree in an effort to efface the scars, in turn gives the shepherd the best sort of kindling with which to light new fires.

New forestry regulations have never been enforced in Serbia. Now and then there has been an order for the complete removal of forest covering in various parts of the country, where it was deemed that the land was more suited for agricultural or grazing purposes. The government imposes a cutting tax upon such timber as is removed, the measurements being determined by forest officers.

The principal difficulty, even in supplying the meagre requirements of the domestic consumption has arisen from the lack of transportation facilities. The mountains on which the timber stands, are often rugged and broken and the rivers which issue therefrom are consequently crooked and hemmed in with rocks, which make driving very difficult. Railroads and highways in many sections are almost entirely wanting. Logging operations can be carried on only along the larger streams.

The timber is removed from the mountain slopes usually by means of chutes running to the rivers. Sled roads are built along the mountain sides over which the logs are hauled to the edge of the inclines. Hauling is done only in the winter when the snow is of sufficient depth. Oxen are used chiefly on the sled roads. Where the topography is more favorable, horse trucks are sometimes used. These trucks are operated over wooden tracks. One of the log chutes built by the Traders' Bank is one and a half miles in length, raised at the lower end to check the speed of the descending load. The logs are stored at the end of the slides from whence they are rafted down stream.

In some localities, the Bleichert system of cable-way transportation has been used with great success. These cable lines are of great service in the rough country. The lines often swing for hundreds of yards over valleys, penetrating mountain walls through tunnels, and making sharp turns. The cable-ways also serve for the transportation of men and supplies and special carriages have been designed for the purpose. One of these lines which is operated by the Traders' Bank of Belgrade has a drop of nearly 4,000 feet in six miles It is constructed with stations at various points. This company found the Bleichert system of great value as the stream in this particular locality, before entering into the Drina River, narrows down to less than seven feet in width, flowing with great rapidity through this box canyon and making driving impossible.

Without a doubt in the near future, Serbia will win a way to the Adriatic, across Montenegro and Albania. Railroads, although difficult of construction, but short in length, will carry a wealth of traffic, a large share of which will be lumber products. When these are built, Serbian timber will begin to play an important part in the European markets. The initial stages of development will take care of the needs of the Mediterranean countries. The success of lumbering operations recently undertaken in nearby Bosnia, catering to this trade, make the future for the Serbian lumber industry very bright. It is believed that Serbian lumber will displace to a great extent the material imported from Norway, Sweden and Russia, especially in Southern Europe and it is even hinted that the other lumber markets of Europe will feel the influence of the activities in this region.

Eight Settlers Burned Out

(Victoria, B. C., Times, June 9.)

Advices to the minister of lands from the Fort George forest district point to the exceedingly hazardous fire situation prevailing in that country, and extending throughout the northern interior generally. While showers fell during the early part of last week, they were insufficient to curb the dangerous conditions, and were followed by a return of the hot weather, with gales previously reported. The dry soil cover continues to supply a factor of much concern, owing to the retarded vegetation.

Many fires are reported, both on non-timbered and timbered lands, the efforts of the forest officers being mainly directed to saving the latter. Three million feet of timber have been destroyed at Willow River. Other damage included the destruction of thirteen cabins at Alza Lake and eight buildings at Chief Lake, many people being destitute in consequence, and some have barely escaped with their lives.

The majority of the outbreaks have been ascribed to accidental origin, as well as to the work of incendiaries, only a few being so far traced to the clearing operations of settlers. As a precautionary measure, fire permits have been cancelled in the dangerous sections, and one arrest has already been made for violation of the fire law. In a later telegram the situation remained unrelieved, although rain was threatening. Eight more homes are reported to have been destroyed. Eight settlers burned out

Germans Use Paper Beds

Paper beds, with paper sheets and paper pillow cases, are now being used in Germany by the poor. The material for mattresses and bedding has become so dear that it is impossible for any but the comparatively rich to afford them.

The mattresses are now made of strong sheets of paper pasted together and filled with dried leaves of beech and oak trees. These leaf mattresses are said to be as comfortable to lie on as any filled with feathers.

The paper used is toughened by a special process, which prevents tearing easily. The leaves for filling the mattresses and pillow cases have been collected in the great German forests by bands of children at a practically negligible cost.

Would the Ontario Settler Object?

Would the Ontario settler object to a system of 'permits' issued by forest rangers for the burning of his clearing slash? Settlers in Quebec and British Columbia are contentedly co-operating with the provincial forest administrations under the permit system, with the result of enormous savings in timber and greater safety to the farming communities.

Would the Ontario settler object?

Read what the Ontario Department of Lands and Forests says on page XI of the 1915 report:

"In the Port Arthur district there were several fires caused by settlers clearing land. About 200 acres of small timber was damaged, 13 SETTLERS LOSING THEIR EFFECTS AS A RESULT OF THESE FIRES."

Would the Ontario settler object?

Market For Canadian Lumber in Cuba

The following article, forwarded the Department of Trade and Commerce, Ottawa, by Mr. J. C. Manzer, special representative of the New Brunswick Government in Havana, will be of interest to Canadians, showing as it does the wide market in Cuba for lumber, and the part that this island is taking in the industrial activity of the world.

Cuba imports annually about 600,000,000 feet of lumber. This consists, for the most part of pine, spruce and fir, and is imported in the form of inch boards, running from six inches to twelve inches in width; planks two and three inches thick and of various widths, and deals sawn to various dimensions to conform with orders received. This is shipped just as it comes from the saw without being planed, and when imported in this form is not subject to duty.

The greater part of this lumber comes from the United States, principally from the gulf of Mexico ports, but Canada supplies a large quantity which might be increased to a great extent.

A large part of this lumber is brought here on schooners, but since the ferry service between Cuba and Key West has been in operation, considerable lumber from Florida and Georgia is shipped by rail. This lumber on arrival in Cuba is taken direct from the docks to the mills, where it is planed and made ready for building purposes. It is then shipped to all parts of the island.

The increasing prosperity of the island has largely increased the demand for lumber of all kinds, but lack of vessels has prevented the necessary supply from being obtained, and consequently has curtailed building operations to a great extent.

The labourers in the cane fields, now that they are getting more pay for their work are no longer content to live in houses constructed of palm leaves, but are constructing wooden houses which are much more comfortable. The clerks in the business houses, many of whom have been living in small poorly ventilated rooms in the crowded parts of Havana, are now getting building lots outside the city where they are constructing houses, mostly of wood, where their families can enjoy the fresh air and sunshine. The business men are also building residences in the suburbs, mostly of brick or concrete, but even these require large quantities of lumber for doors, windows, staging, moulds for concrete, etc.

Spruce and pine from New Brunswick, Nova Scotia and Quebec; also spruce, fir, hemlock and cedar from British Columbia would be suitable for all building purposes in Cuba. Besides this class of lumber Cuba imports quantities of shingles, thousands of crates for fruits, shooks for packing cases, stave heads and hoops for making barrels, and large quantities of broom-handles.

Canadian pine, spruce and fir would be quite suitable for the manufacture of fruit crates and packing cases. These are imported cut in exact lengths ready to be nailed together, and tied in bundles. Birch, maple and ash would be quite suitable for barrel heads, staves and hoops. These arrive tied in bundles, and when put together are used for packing beer. Canadian yellow birch and maple make the best broom-handles.

Canadian lumber will fill nearly all the requirements of the building trade in Cuba; and as Canada is a large seller of lumber while Cuba is a heavy buyer, it would be advisable as soon as the war is over, and conditions become normal again to make an effort to secure a larger proportion of this Cuban lumber trade.

Sowing Forest Tree Seeds

The Earl of Selborne, president of the Board of Agriculture, has communicated with the members of the Royal English Arboricultural Society through their president, Lord Barnard, urging the need for sowing forest trees this year. Even small sowings, he says, would be useful, for in the aggregate a large number of seedings might result, and he specifies the trees likely to be most in demand, after the war, namely, larch, common spruce, Sitka spruce, Scots pine, Douglas fir, silver fir, Corsican pine and beech. Lord Barnard heartily supports the appeal.

Experimental Plots

The Laurentide Company, Ltd., of Grand' Mere, Quebec, has a large tract of land, at present about twelve hundred acres, devoted to planting and experimental cutting operations. Different systems of cutting are being tried out and experiments in natural regeneration also. In all these thinnings or cuttings the slash is piled and burnt. Plots have also been marked off and all the trees numbered and a band painted about them at breast height, and each year the diameter growth is measured. Plantations have been made not only in the open but under different kinds of stands and on different soils. Experiments in draining swamps are also to be undertaken and a system of good dirt roads and fire lines is also kept up.

A Progressive Move

The Canada Paper Company, Ltd., of Windsor Mills, Quebec, intends to cut fire lines and clean up the debris on their holdings this spring. This company is especially fortunate in having freehold lands within easy reach of their mills and they are in a position to get the greatest possible value out of forestry methods. It is the intention of this company also to plant up their waste lands and lands not fully stocked.

Riordan Company Planting

The Riordan Paper Company of Montreal have decided to commence planting operations on their limits, and their forester, Mr. Volkmar, has been investigating the plantations and nursery methods of the Laurentide Company of Grand' Mere. It is interesting to note how the progressive paper companies are taking up the planting idea and there is no question but that such a policy will prove highly productive in the long run.

Canada's Maple Sugar Industry

There Are 55,000 Makers of Sugar and Syrup in the Dominion, Holding 1000 Square Miles

The possible money value to Canada of the maple industry is far greater than is generally supposed. There are at present no less than 55,000 makers of maple sugar and syrup in the Dominion. Allowing a ten-acre bush to each farmer would mean that 550,000 acres, or about 1,000 square miles, are being reserved in their natural wooded state, a most important matter for the conservation of our springs and rivulets. In this large area, no less than two-thirds is situated in the province of Quebec. There are a few sugar bushes in Ontario and a negligible number in the Maritime Provinces. For some inexplicable reason it has never been realized that we have in Canada millions of acres of maple bush running from the north of Lake Superior to the shores of New Brunswick and Nova Scotia, all standing in their primeval condition, waiting only to be tapped to yield to the world its remarkable wealth. When it is remembered that it is only in the border states of New Hampshire, Vermont and Maine that the sugar maple grows within the United States, and that with this exception, we in Canada possess the whole world's supply, the great importance of the industry will be realized.

Two Millions Worth.

It is estimated, says the Montreal Journal of Commerce, that in 1915 Canada produced two million dollars worth of maple syrup and sugar. In 1911 the output in the Province of Quebec was valued at $1,680,000, a sum 14 per cent greater than the production of our small fruits; considerably greater in value than the sheep sold, almost equal to the sale of our poultry, exceeding that of our whole output of cream, and six times the money obtained from honey and wax. These comparisons serve to show the relative importance of our maple industry, the possibilities of which are too great to estimate, if the immense woods of Ontario and the Lower Provinces were cultivated as they should be.

A peculiarity of the situation is that there is practically no demand outside of North America for this commodity ,and for no other reason than that no effort has been made to make it known to the countries beyond the seas. Needless to say, once the exquisite flavor has been discovered by the millions abroad, there will be no lack of demand for this essentially Canadian product.

U. S. Takes All Export.

At the present moment our chief export market is in the United States. During the five years from 1908-1912, 99 per cent of our exported maple sugar went to the Republic and 50 per cent of the syrup. During these five years we exported altogether 8,685,000 lbs. of sugar and 20,000 gallons of maple syrup, a mere bagatelle in comparison with our capabilities. In May of this year the United States will remove their customs duties upon both our maple products, thereby opening up to us a market that without exaggeration may be termed unlimited, for at the present rate of production we could not possibly supply the demand of 100,000,000 people.

On April 15, 1915, after our last yield of sugar had been gathered in, an Act was passed at Ottawa to amend the Adulteration Act. This is a simple statement and gives but little idea of the struggle and con-

troversy that has been going on for years before it was possible to persuade parliament to protect the industry against fraudulent manufacturers. For a long time, city manufacturers, who never went near a maple bush, have been putting up a mixture of cane, sugar and water flavored either with a small percentage of maple syrup or with an essence called "Mapleine." These syrups and sugars were labelled with such names as "Maple flavor syrup," "Maple compound," etc., while many were not labelled at all. From the following table will be seen the extent to which this systematic adulteration has injured the maple industry, more especially since 1890.

Years.	Production of Sugar lbs.
1850-60	135,000,000
1860-70	175,000,000
1870-80	190,000,000
1880-90	225,000,000
1890-1900	212,000,000
1900-10	196,000,000

Adulteration Stopped.

In 1900 the first steps were taken in protest. In that year, 2,000 sugar makers signed a petition which they presented to the Hon. Sydney Fisher, then Minister of Agriculture. The difficulty at that time was the impossibility of obtaining chemical tests whereby cane and beet sugar could be detected in the maple product. In 1904, the Agricultural Department of the State of Vermont discovered that by using subacetate of lead they could determine if maple sugar or syrup were adulterated. This was of material assistance to our Inland Revenue Department, and in Feb., 1915, a bulletin was issued giving the results of chemical tests on a number of syrups and sugars. It was found that 76 per cent of this collection was adulterated and only 24 per cent pure. The publication evidently had a beneficial effect for in May of the same year, a second test was made which showed a decided improvement, only 34 per cent being adulterated. From that time the Department has issued annual bulletins, but, finding it impossible to stop adulteration, the act already referred to was placed upon the statute books. A most gratifying result is shown in Bulletin 325, just recently issued although dated October, 1915, according to which only 15 per cent of the samples were found impure. On looking over these pamphlets from year to year the names of the same offenders occur again and again. Evidently the policy has been to pay the annual fine and proceed as before. Prior to April, 1915, the fine was merely nominal, but under the new regulations it is to be hoped that an end will be put to the fraud.

The Word "Maple."

The amendment of the Adulteration Act prohibits the manufacture and sale of adulterated maple syrup or sugar, and restricts the word "Maple" to pure maple sugar or syrup, imposing a fine of from $50 to $500 and costs for wilful adulteration; and from $50 to $200 and costs for the sale of the adulterated article.

While the fight has apparently been won, it is felt that only by eternal vigilance will it be possible to protect the honest maker. Those who have been instrumental in bringing about these important reforms are naturally much encouraged and feel that the maple industry stands on the threshold of a great development, with the unlimited markets of Great Britain and the United States lying before it.

Messrs. D. A. Macdonald and C. H. Morse, of the Dominion Forest Service, have been elected associate members of the Canadian Society of Forest Engineers.

According to a writer in "American Forestry" this imperfect elm is worth $51.96. On the author's system of calculating tree damages, the high tension wire passing through the branches greatly impaired its value and will still further impair it. If it was in perfect condition it would be worth $181.54.

Odd Conditions in Nigeria

Close Supervision of Cutting in these Tropical Forests With View to a Continuous Production

By A. H. Unwin,
Member of the Canadian Forestry Association

European forest officers are of two ranks, the scientifically trained conservators of forests and the executively trained foresters.

The scope of this paper will only cover the former, as very few of the latter are European, and most of them Nigerians.

From Oxford, Cambridge and Edinburgh, graduates in forestry can usually be procured. The training at these centres covers, roughly, a year or a year and a half's work on the elementary subjects, such as botany, mathematics, geology, mensuration, surveying, and political economy. In addition, a year or two years' work on the professional subjects, silviculture or the growing of forests, forest protection, forest utilisation, forest botany, forest entomology, forest history, and forest policy, is required. At the end of the course six months' practical work in Scottish or English forests follows, during which period working plans and market conditions are especially studied.

The Training Course.

After being accepted for appointment in Nigeria, a further three months' course is taken at the Royal Gardens, Kew; and six months' practical work on the Continent was (before the war) usually required. At Kew the object is to acquire a working knowledge of the most important botanical orders which contain the African trees. The Continental course shows the student forests which have been under a definite scheme of management for over a hundred years. It takes one, in fact, through the life history of a tree from a seedling in the nursery bed to the well-grown financially mature tree, marked ready for the axe, a period of about eighty years.

The initial appointment is for three years on probation, after which it may be confirmed. The initial salary of an assistant conservator of forests is £300 per annum, rising by increments of £15 to £400 per annum. The first appointment dates from the day of sailing, the passage being paid by the Nigerian Government, and salary on half-pay begins from the date of departure until the arrival in Nigeria, when full salary begins to accrue. Intending candidates should bear in mind that an early selection for appointment entitles them to seniority over other candidates who, owing to their being fully qualified, are appointed immediately, and thus reach the colony before them. Locally, a commuted travelling allowance of £42 per annum is drawn to compensate for the extra cost entailed in inspecting the forests. A limited number of carriers, or other means of transport, are provided by the government. For the purpose of more rapidly getting about, a bicycle, motor, or horse may be kept, and an allowance is given for maintenance. The cost of living is high, even when furnished quarters or a bungalow are provided.

Reaching Headquarters.

Lagos is the first port of call in Nigeria, and there is a railway journey of 123 miles before reaching Ibadan, the temporary headquarters of the Forest Department. Oloke-

meji, ninety miles from Lagos, is the old headquarters, and here the forestry work of the Southern Provinces is directed. Zaria, situated some 450 miles from Lagos, is the headquarters of the Forestry Department in the Northern Provinces.

A newly appointed officer would be liable to be sent to either of these last-named places; but owing to the larger number of men being stationed in the Southern Provinces, the majority are sent to that centre. Olokemeji is in the middle of a forest reserve, 26 square miles in extent, and is also the headquarters both of the Western Circle and of its Northern Division. In each circle there is a conservator of forests in charge, and he has an assistant to manage each divison. In the event of a shortage of staff it may happen that a new man is put in charge of a division, and thus has an opportunity of learning all about the work much more quickly than would otherwise be the case. In the ordinary way he only corresponds with his conservator and the timber interests of his division on purely local matters.

The Tricks of Carriers.

At first sight, on examining the tropical forest, it appears like a very mixed collection of different kinds of trees; on closer inspection, however, similarities and contrasts are apparent, such as ebony, with its thin, black, scaly bark, and that of the somewhat regularly, deeply fissured bullet-wood tree, and its white latex, which the former does not exude.

In walking through a forest it is normally best to make the carriers precede, though their scent is not entirely pleasant if one is close behind. Owing to their tendency to lag, and their desire to sit down at inconvenient times, it is an advantage to have them in front. Frequently one may have to stop and examine a flower or leaf, and it only adds to the carriers' labour if the whole column has to stop whilst seeds and specimens are being collected. A march of about fifteen miles is sufficient, and takes up the better part of the day if an examination of the forests is being made on the way. In most parts villages are eight to ten miles apart, sometimes nearer, so the carriers can stop and purchase food. In the larger forests, however, a distance of over twenty miles is sometimes covered without sight of a house; in that case, the people of the last village are asked to bring food for the carriers, and the carriers themselves are given a day's food as well, which has to be cooked on reaching camp. In some places the chiefs provide food (yams etc.) which is distributed to the carriers, or in some places 3d a day per head is allowed them for purchasing food. So long as the carrier gets food ,and his load is not excessively heavy, he is quite cheerful and walks well.

Nigerian Wages.

Current wages vary from 9d. to 1s. a day, the headman getting from 1s. to 2s. a day. Local felling permits being issued both by the district and forest officers to natives for felling timber for local use, at district stations a call is paid to the District Officer to discuss current forest questions and examine the permit books. At the same time there is an opportunity of seeing what further development of forest work is possible in the district. The local forest guards, foresters, or forest rangers report themselves, usually giving a very good account of the local forest conditions. Since the demand for local timber has been growing, a stop may have to be made to supervise the marking or girdling of suitable trees for bridge building under the auspices of the Public Works Department. On a journey through the mahogany forest, the different camps of the timber firms have to be visited. These firms have hundreds of square miles for the pur-

pose of exploiting mahogany and furniture woods. At the same time the checking and inspecting of the stumps of all these trees felled has to be gone through. The young mahogany seedlings are also seen, and from the number of these it is known whether sufficient have been planted to take the place of those cut down. The very rapid growth of these trees can here be studied to advantage; trees now 40 feet high have only been planted a few years. The relative value of the direct planting of seedling trees as compared with the natural regeneration of the forest by self-sown seedlings can be observed with ocular clearness. In one part of the forest one sees natives standing on a platform hacking away with an axe into a huge 50 foot mahogany; in another place a similar tree, fallen, its 90 foot bole already sawn into three round logs, while in a third locality may be seen a native, axe or adze in hand, squaring mahogany logs with a four foot side. Later in the season eighty or more natives are engaged in dragging one of these logs on round billets of wood (for rolers) along a track, roughly cleared to the height of a man, to the nearest natural waterway; still later (that is, in July or August', when the rivers rise, the logs may be seen floating singly down to the rafting place on the main creek, where rafts are made with logs four or eight abreast, each fastened to the next from a timber dog at either end, with cane. From here riverine natives, such as the Ijors, take the logs to the nearest river or ocean going steamer port.

The Timber Market.

The Forest Department has supplied the Railway, Marine, and Public Works Departments with timber of various kinds. In some cases the timber is obtained by departmental working, and in others is cut by native contractors under the supervision of the department. In the first instance, the conditions under which timber is to be supplied to other departments are put before the Secretariat, and, when once the work has been begun, the local forest officer deals direct with the department concerned.

Forestry progress in Nigeria has been less tardy than in several other colonies, though many forests have been destroyed owing to lapse of time before the formation of a department. In 1904 there were eight, and there are now 24 administrative appointments. The amalgamation of Northern and Southern Nigeria into one administration should accelerate the development of forestry. It is as yet only in its initial stages, and scarcely more than a thousand square miles of forests, out of nearly a hundred thousand which exist in some form or other, have been permanently set aside for further timber production. The revenue-earning capacity of the Forest Department has been somewhat diminished by the war, but with recent legislation more local revenue should be obtained, which should more than off-set any loss already sustained. Provided the financial position of Nigeria remains strong, the prospects of the Forest Department are quite bright.

Although Nigeria has by far the largest Forest Department, very similar conditions of service obtain in the other West African colonies of the Gold Coast and Sierra Leone; but there are no forest officers in the Gambia.

Civil Service Efficiency

"The civil service of Canada," says the Ottawa Citizen, editorially, "has many able and fearless and conscientious men and women in it. What an asset it would be to this country to have its civil service free from the menace and molestation of patronage ministers, who really reflect a bygone age of barbarism and not the science of government as it is understood in this the twentieth century. It is only necessary to review the immense service the Auditor General has been, and still is, to Canada, to get a glimpse of how much better off the Dominion would be if the entire civil service were elevated to the same plane of economic security and freedom from patronage domination. The Canadian public should welcome any movement to put the civil service on a better basis. Could such a movement not be initiated from within the service itself?"

It has been pointed out frequently that the outside service of the Dominion Forestry Branch can be brought under the merit system of the Civil Service Act without new legislation. Were such action taken it would remove one of the worst drags on efficiency which the country is compelled to carry.

Mr. Ellwood Wilson, Forester of the Laurentide Company, recently made a trip to an aeroplane factory to examine aeroplanes and see if they would be practical for forest fire ranging work. He reports that while for finding fires they are entirely practical, they are so difficult to launch and to land with at present that they are hardly practical as yet. "A suggestion made by someone that clearings of seven or eight acres in extent be made at convenient places in the forest for landing and starting is out of the question, as such clearings would be too expensive to make and keep clear, and the great value of the aeroplane would be its ability to travel fast, see over a large area at once, and to alight near a fire and extinguish it. This latter is the most important and the most difficult thing for an aeroplane to do. Of course, a flying machine travels so fast that a fire could be reported without delay, but by the time a crew was organized and transported some fifty or one hundred miles the fire would have gained a big start. It is certain, however, that these disadvantages will soon be overcome and the necessity for lookout towers and slow-moving rangers will be done away with."

Lectures at Summer Resorts

The Secretary of the Canadian Forestry Association will deliver a series of "Forest Travelogues" at the largely populated summer resorts of the Muskoka Lakes and Georgian Bay, during the last week of July.

Arrangements have been made for the following itinerary:

Minnicoganashene, Georgian Bay, Friday, July 21.

Wawa Hotel, Norway Pt., Monday, July 24.

Highland Inn, Algonquin Park, Tuesday, July 25.

The Monteith House, Lake Rosseau, Wednesday, July 26.

Beaumaris, Thursday, July 27.

Elgin House, Friday, July 28.

The Royal Muskoka, Saturday, July 29.

In building up the attendance at these lectures the Association has had the assistance of hotel managements, railways, etc. One hundred and fifty pictures are given during each lecture. The Association bears all expenses, including advertising, printing, etc., thereby leaving to the local authorities the sole responsibility of securing a good audience.

How Europe's Forests Are Paying the Price of War

The Severity aud Mobility of the Conflict Have Taken Fearful Toll of Richest Woodlands

Only when the European War is over and a detailed examination made of the enormous areas of forest surrendered to axe and shell fire will the world know exactly what penalty the timber resources of France and Belgium have paid since August, 1914.

Not only have the Belgian forests and those of the occupied sections of France suffered fearfully by the 'legitimate' necessities of war, but by the deliberate vandalism of the German hosts. As was described in the June "Forestry Journal," the French military authorities have made demands on the Forest Service for materials which cannot be supplied in the time given without injuring seriously the future productivity of the forests. Belgium's richest timber possessions have largely perished either in the first terrible onslaught and stubborn defence, or by the systematic thieving of the German government to supply their home needs without crippling home resources. An article by Mr. J. S. Illick in "Forest Leaves" of Philadelphia, brings one into close touch with the conditions as they existed immediately before the War.

Many and varied are the factors which enter into a consideration of the total amount of damage done. Two groups, however, stand out prominently above all the rest. They are: (1) the prevalence and condition of the forests at the beginning of the war, and (2) the severity and mobility of the conflict. These two groups of factors have very few points in common along the three main battle fronts; viz: the western front in France and Belgium, the eastern front in western Russia, eastern Prussia and Galicia, and the southeastern front in the eastern Alps and the Balkan states. The forest conditions along these three main fronts differ just as widely as the military operations now in progress along them. It is not the object of this article to discuss the military operations now in operation concerning which our daily papers and periodical publications give us ample and fairly authentic information, but rather to describe the condition, prevalence, and economic significance of the forests embraced within the destructive clutches of this gigantic and prolonged struggle. The writer travelled afoot—prior to the outbreak of war—over large areas of rural Europe, particularly the heavily forested portion, and in a few instances traversed the very spots now dissected with tortuous lines of trenches. It is difficult, even for one having been upon the ground, to picture the transformation that is taking place. Today bare, unproductive, and eruptive areas indistinctly mark the sites of former fertile field and finished forests.

The Forests of Belgium.

Forests were common in the western war zone, embracing a part of northern France and almost all of Belgium, when the conflict began, and showed evidence of careful management that must have extended back at least fifty years and in some cases a full century. Belgium alone had 1,290,000 acres of productive forest land valued at $100,000,000. The province of Namur, in which such heavy fighting took place shortly after the beginning of the war had 31 per cent of its total area wooded. The forests of Belgium were among the most productive of Europe before the war, yielding 1.7 cords per acre and year. Since the war began this area has not only been considerably reduced in acreage, but what is more lamentable the remaining forests have lost all the "earmarks" of that careful management which characterized them in the past.

That the people of Belgium will feel the loss of their clean, attractive, productive, and well-organized forests is most certainly true. The small forest acreage in proportion to the population—only two-tenths of an acre per inhabitant—and the industrial conditions, recommended an intensive management of all areas suitable for the growth of trees. The native forests in spite of their high productivity—1.7 cords per acre and year—yielded only a small portion of the total amount of wood consumed by this most densely populated civilized country—660 inhabitants per square mile. About $28,500,000 worth of wood was imported annually, some of it coming from the United States. For many years the demand for wood has been so great that every square foot of ground not required for other more important purposes has been used for the production of this much-needed product. About 84,000 cords were obtained annually from trees bordering roads and canals. These trees, however, did much more than yield wood, for they made the thoroughfares attractive and comfortable, and in some instances produced choice fruit. Few countries could boast of such inviting and distinctive highways, byways and waterways as Belgium before the war. These attractive and useful avenues of communication helped, in a measure, to satisfy and solidify its citizenry, and develop a pardonable patriotic pride in its soldiers.

Private Ownership.

The kind of forest ownership that prevailed in Belgium at the outbreak of the war presents a sad aspect. Private individuals and small communities owned 93.8 per cent of the total area, the state and institutions owning the remaining 6.2 per cent. The loss under such a decentralized form of ownership is certainly felt much more keenly than in countries such as Germany where the several states own 31.9 per cent and private individuals only 46.5 per cent, the remainder belonging to the crown, communities, municipalities, and institutions. When one thinks how slowly forests grow and how difficult it is to reconstruct them, one's pity naturally goes forth not only to the altruistic and beneficient people who were building them up, but also to the oncoming generations for whom they were being developed. A rich heritage for subsequent generations was in the process of development, but the sudden onrush of an enraged neighbor with no respect for property or posterity, and the necessary destructive activities of the defenders of the homeland, soon converted this prospective heritage into acres of desolation.

The forests of northern France differ little from those of Belgium in condition, composition and ownership. The hardwoods—chiefly

oak and beech—comprise from 70 to 80 per cent of the total. Scotch pine, the leading conifer, was limited to the poorer soils which locally comprised rather extensive areas. In the region south of Rheims extensive limestone wastes occurred at the beginning of the last century. About 1807 a movement was started to reforest these wastes. Little was accomplished, however, until about 1830 when reforestation began on a large scale. Just before the war began over 200,000 acres of this waste land had been stocked with trees, mostly Scotch pine. The outstanding feature of this remarkable accomplishment is the commendable fact that most of this vast area was not restored to a condition of superpristine productivity by the state or nation, but by numerous self sacrificing owners of small holdings. Year after year the small woodlot owners upon clearing their land, again prepared it—often by spading or ploughing—for another forest crop, fuly realizing that they would never live to harvest it. The new crops, as a rule, were established by planting small seedlings furnished by local foresters at a very reasonable price, usually the cost of production.

Land Prices Go Up.

That the line of endeavor along which these private owners were progressing was commendable and producing results is shown by the phenomenal rise of land prices. The very areas which sold for $4 per acre before afforestation began were selling for $75 to $125 per acre just prior to the war. The sad part of this narrative is the regrettable fact that these numerous areas of forest land upon which so much private effort and money had been spent were either destroyed or damaged heavily during the battle of the Marne. Areas of forest devastation and destruction do not occur in local spots, but are distributed throughout northern France and all of Belgium. The great size of the contending armies, the severe, frequent and often prolonged battles, and the almost stationary position of the battle line causes one to conclude that the damage is so great that an overestimate would be difficult. One may be able to comprehend in part the existing conditions in northern France from an announcement in the bulletin of the Southern Pine Association of January 17, 1916, which states that "Bids are being asked for 52,000,000 feet of southern yellow pine by the French Government, presumably for the erection of 10,000 houses which it has planned to build in northern France following the war."

Forest conditions along the eastern front in eastern Prussia, western Russia and Galicia stand in contrast with those found along the western front. The forests are larger in size, cover a much greater percentage of the total land area, and are composed almost entirely of evergreen species which comprise from 85 to 90 per cent of the stands, while along the western front not more than 20 per cent were evergreens. The forest structure is also much simpler, in fact, so simple and uniform over vast areas that it becomes monotonous, especially to an American, who is accustomed to find from 50 to 100 species of tree in one locality. Scotch pine and Norway spruce are the only common and important species. The former occurs in extensive pure stands on the sandy plains and in rolling country. It is at its optimum in the Baltic provinces of Prussia and the Riga district of Russia where it attains a large size, possesses straight and clean trunks, has uniform growth rings, and produces much pitch. The Norway spruce increases in abundance as one goes northward or ascends the mountains. Beyond Riga the White Birch becomes a distinctive feature of the forest, however, not on account of its abundance but rather due to its con-

spicuous white bark. Forests in which it is rather common, are often called "white forests" in contradistinction to the "black forests" of evergreens.

On the Eastern Front.

The damage and destruction along the eastern front has extended over an enormous territory due to the great length and the continuously changing position of the battle line. As a rule the degree of destruction has not been so complete nor the extent of damage so great in any one locality as along the western front, but a much greater area has been covered by the almost continuously retreating and advancing armies. The total amount of wood already used, damaged, and destroyed must be enormous. The loss, while large in amount, will, however, probably not be felt so keenly as in Belgium and northern France, where a much larger percentage of the forests were privately owned. Furthermore, a greater percentage of the total land area along the eastern front was still wooded, thus making wood a less expensive commodity on account of the larger supply still available.

The loss is not limited to the immediate vicinity of the forested regions but extends even to foreign lands. Russia was a great wood exporting country before the war. About 60 per cent of the export wood left through Baltic ports. Riga, the objective point of one of the German armies, in the environs of which much fighting has recently taken place, led all other Baltic ports in the exportation of wood. Through this port alone about 18,500,000,000 cubic feet of wood, mostly Scotch pine, left annually for foreign countries, principally Great Britain.

Canadian Research Bureau

The Canadian Pacific Railway and others interested in the establishment of the Canadian Research Bureau, deserve the warmest praise for having brought this about. The Bureau have secured the services of Mr. Arthur D. Little, a well known engineer of Boston, and a former President of the American Chemical Society. Mr. Little is eminently qualified to head such an organization, and we predict that it will be productive of much good.

In brief, the object of the new research bureau is to investigate, organize and systematize our resources. It will carry on a scientific investigation of the mineral, metal, hydro-electrical and chemical resources of the nation and formulate plans for the lessening of the waste in our forests, factories, mines and mills. The results of the Bureau's investigations will be sent out to manufacturers, merchants and others interested in the form of bulletins.

Restoring the Slate

Slates may be brought back into schools in the United States on account of the shortage of paper.

Cheap paper writing tablets now used in schools may disappear, or what is more likely, become prohibitive in price. Common five-cent tablets now contain little more than one-half the sheets they did before the beginning of the war, and paper firms say they are being furnished at an effort.

U. S. Government Paper Bill

More than 30,000,000 pounds of paper, embracing almost every kind in present-day use and costing approximately $1,250,000 a year, is used in the government printing office, making the United States one of the largest buyers of paper in the world.

(Courtesy of Grand Trunk Ry.)

BEAUTIES OF ALGONQUIN PARK.

A splendid view of Cache Lake, Algonquin Park, showing the heavy forest growth, the maintenance of which is the foundation of a large and increasing tourist traffic.

Common Sense Guardianship Is Wanted

Organ of Canadian Manufacturers' Association Makes Emphatic Plea for Immediate Revision of Ontario's Forest Policy

Public sentiment in Canada on the question of forest protection and the need of guarding more than five thousand wood-using industries from the menace of forest fires has reached a point which none of our governments, provincial or federal, can safely ignore. Through the efforts of the Canadian Forestry Association and other bodies, the facts regarding Canada's dependence upon cheap and abundant supplies of wood and the enormous damage wrought annually by preventable fires have been made matters of common information in town and country from coast to coast.

The improvement in public intelligence on such questions has been reflected in governmental action in two provinces, Quebec and British Columbia, in a radical advance of the forest protection services. Very sensibly the British Columbia Gov-

ernment recognized its duty in giving protection to the main sources of provincial income, and has succeeded in introducing a modern and energetic forest service which already has greatly diminished the likelihood of a wholesale timber loss in the future. The Quebec Government looked upon its responsibilities in the perpetuation of the timber and timber industries in a spirit no less advanced. As a result, the Quebec Legislature passed at its last session an amendment rendering it unlawful for a settler to undertake to clear his land by the use of fire, without first obtaining a permit to do so from a qualified ranger. This obviates the ever-present risk of settlers' fires being set out on excessively dry or windy days, and also insures that the heaps of slash shall be kept in the centre of the clearing.

Quebec is also awake in its efforts to make incendiarism in forest areas punishable to the same degree as fires in a town or village. Under Quebec laws several scores of prosecutions of settlers who caused forest fires last year were undertaken, and in many cases fines were imposed or the guilty parties imprisoned.

Ontario, however, has not yet seen fit to apply the obviously necessary reforms in its forest protection service which have been so generally accepted by British Columbia and Quebec, although the latter have less to fear from large fire losses in the forest than has Ontario. It is generally agreed that forest protection in Ontario suffers from lack of organization both at headquarters and in the field. The men are, of course, political appointees, but even political appointees may be carefully and intelligently selected. The supervision and inspection of fire rangers is just as necessary as the supervision and inspection of the employees of a locomotive works. Left to themselves, the serious duties of forest protection are not likely to be carried out. This lack of actual service as rendered by Ontario's fire rangers does not mean that the province is saving money in comparison with other provinces. On the contrary, the lack of supervisors is a costly proceeding; the losses in timber resulting from inefficiency can scarcely be computed. Rangers in British Columbia or in the well-organized sections of the United States have few leisure moments in their daily rounds. The opportunities for education of the local residents by the rangers are extensive. They can build trails and lookout towers, and it is their business to construct safe camp-fire places for hunters and fishermen and campers who make use of the areas within their patrol. They can guard the timber against settler's fires by curbing the carelessness of the settler. That Ontario gets more than a fraction of the reasonable amount of service due from its large number of rangers is doubtful.

Settlers' fires have been proved to be one of the worst source of timber loss. Knowing such facts, the provincial government has taken no steps thus far to overcome the evil. British Columbia and Quebec have prohibited settlers from carrying on burning operations without the advice and supervision of the ranger, and they must secure from him a special permit. This regulation works no hardship on the settler and is a most valuable protection to standing timber. At present, in Ontario, no matter how conscientious the ranger, the settler may snap his fingers at him.

Sir Clifford Sifton has estimated that at the present rate of cutting and burning, the forests of Ontario could not last more than thirty years. This brings the province face to face with a most grave problem. From no other source than

our present standing forests can the two-thousand wood-using industries of Ontario secure their raw materials. Forest fires, indeed, spell gradual extinction for a most important section of the country's industrial life. Having such knowledge, and with no chance of disputing the *responsibility* of the provincial government in the care of the timber, it would seem that this year should see signs of a concession to the demand for a common-sense guardianship.

Fires at the Coast

(Vancouver World, June 15.)

Owing to the absence of rain during the past few weeks the usual danger from forest fires threatens, and reports from outlying districts received by Mr. George D. McKay, provincial timber inspector, show that already numerous fires are under way although the majority of them are under control.

Two fires are reported by Ranger R. V. Stewart one on the limits of the Campbell River Lumber Company at Hornando and another in the cuttings of Land Bros. at Wilson Bay. The former is a small one, and is said to be well under control. The latter is a fire of serious proportions, and for a time threatened the homes of a number of settlers near. The latest report from that place states that it is now fairly well in hand. Fires are also burning in the timber north of Cape Lazo and east of Courtenay, on Vancouver Island. Another small fire has started near Coquitlam, in the Dominion railway belt, and several others east of Langley. No harm has been done by them as yet.

"The lateness of the spring, the scarcity of green foliage and the warm weather of the past few days, are the causes to which these outbreaks can be attributed," said Mr. McKay. "Had there been the usual heavy growth of green foliage the fires would not have had the chance to spread. We are well organized, however. Our rangers and guards are all on the lookout for fires, and in addition, this year the loggers seem to be better equipped than they have been to fight the fires. All of the camps have a good supply of pails, buckets, hose and other equipment for fighting the flames, and the danger seems to have impressed itself upon every man employed around the camps. Our guards and rangers are taking all precautions to prevent any large fire from breaking out, and I think that the outlook is considerably better than it has been for several seasons."

Quebec Settlers Obey New Permit Laws

That settlers in forested districts will accept sensible legislation in the spirit in which it was designed has been proved by results in Quebec thus far in 1916. The amendment passed at the last legislature requires a settler to obtain from a ranger a permit to start his clearing fires, such a stipulation blanketing the entire season of fire danger. The Lower Ottawa Forest Protective Association report that to the first of June, 1916, about 350 settlers' slashes have been burned in their territory under permits.

The rangers and inspectors report further that "we are receiving hearty co-operation from the settlers, no prosecutions of offenders having been rendered necessary as yet. The new laws are of much benefit and we encounter little trouble in having them painstakingly applied."

Turning Slash into Dollars

Utilizing Refuse of Logging Operations for Fuel, Ashes and Pulp would Bring Riddance of Fire Problem

By Thomas B. Wyman,
Secretary-Forester of the Northern Forest Protective Association,
Munising, Michigan

The title of this paper requires the consideration of two conceptions: the one that of the general term "Slash,"; and the second, the idea that there is a problem connected with the presence of slash from forest operations.

Slash—in the broadest sense of the word, means the refuse from the harvesting of timber, and includes tops, branches, hollow butts, and all such material as is commonly left after taking out the so-called Merchantable Timber.

Slash may be created by clear cutting operations, in which all merchantable timber is removed, or through the selection system of operating, by which only certain species or certain sizes are utilized. In the first case, nothing is left upon the timbered area except Slash, unless perchance, the natural deposit of seed from standing timber has resulted in the establishment of a seedling growth. Usually, however, such a growth is entirely unnoticed by the lumbermen, and entirely ignored as to value, either present or future. In the second case, a certain amount of Merchantable Timber stands among the Slash ready for the harvest, and whether or not this standing timber will ever be utilized for commercial purposes depends entirely upon the proper solving of this slas hproblem.

The problem of slash is in reality a problem of fire control within the slash; or of preventing the burning of operated areas and the consuming of the refuse material. As yet, we have made no actual strides toward the elimination of the menace of slash and it is this menace, more than any other, against which we must guard to prevent destruction to standing and harvested timber by fire.

Slash, the Great Menace.

The state of Michigan has been the scene of logging operations for many years, and during this time, thousands upon thousands of acres of slash have been created—and burned. With the burning, destruction has spread to standing timber, either killing it outright or damaging it to such an extent that unless immediate operation could be instituted, a large financial loss must necessarily accrue.

The area of slash through which fire has not spread is hard to find.

Michigan embraced within its area thousands of acres of standing Pine—White, Norway and Jack—either in pure groups or in mixture with each other. The day of the original Pine in Michigan has passed, and we have left, to jog our memories, thousands of acres of these so-called Pine Plains. These Pine Plains are simply areas of pine slash destroyed by fire and consistently reburned, until all soil cover has been consumed and the vegetable content of the upper soil largely depleted. With the burning of the pine plains occurred the destruction of seed trees, unthinkingly left and

of the natural regeneration by which nature sought to reclaim these vast areas.

Having succeeded in eliminating the pine forests of Michigan as a commercial asset, inroads are now being actively made upon our Hardwoods and other timbers, and although the condition may not be so acute when uor hardwood lands are cut over—because of greater agricultural possibilities upon them, we will still have our non-producing fire burned pine plains as an evidence of the improper solution of the slash problem.

Authorities differ as to the proper solving of the problem of disposal of refuse from logging operations, but the common assumption is that to secure safety, slash should be burned. In fact, we have in some states, compulsory slash burning, thus compelling operators to invite further ravages by the demon—FIRE.

I do not believe in the use of fire under any circumstances, nor do I believe it necessary to expend a considerable amount of money in this work, thus adding to the cost of production by way of windrowing, brush piling or top-logging; but on the other hand, until means are devised by which slash can be UTILIZED, forest management, which should include patrol, fire lines, lookout towers, and educational features should prevail.

This question at once presents itself: Can slash be utilized? And I say in answer that there are many products which can be derived from the saving and utilizing of the forest slash, and if the returns from such utilization meet the cost of the necessary saving operation, the gain —that of the elimination of the forest fire danger—is both real and material.

Fuel, Ashes, Pulp.

And now, having concluded that the utilization of the slash, or the refuse from logging operations is a feasible, and the reasonable procedure, let us consider what products and by what means such material can be harvested. Of the many products which can be made from forest refuse, the three which appear to offer the greatest possibilities, are: first, FUEL WOOD; second, ASHES; and third, PULP.

Abroad, the utilization of FAGOTS or fine wood as fuel, is in general use. Why not begin the saving of our best body timber for commercial use, and encourage the utilization of our present waste by turning it to fuel purposes?

This can be accomplished by educational means, covering both the necessity of the saving of the better grades of wood and the possibility of using for fuel those grades of less commercial value. The actual method of reclamation may be nothing more than the axe, the saw and means of transportation. Equipment could, of course, be developed as the exigencies of the case necessitated.

In years to come we will look back upon this wasted asset with wonder at our lack of foresight.

The production of ashes for fertilizer, potash, lyes and other biproducts is also easily accomplished, and entails only the destructive burning of the slash in closed furnaces or retorts, so that NO DAMAGE results to the soil and NO RISK to surrounding property.

How much are Unleached Hardwood Ashes worth? Just ask your dealer, and the figure will surprise you. "But" you say, "ashes are a fertilizer in themselves, and when the slash is burned, it returns this ash to soil." This statement is but partially true; and even if wholly true, neither solves our problem nor is it often of value.

Modern science is constantly at work in the paper making industry as in other lines, and great advancement has been noted. We recognize as paper making material—straw,

rags and fibres of many kinds, most prominent of which is wood fibre; but to date, the wood fibre used is largely of the body variety rather than the refuse product—for high-grade papers rule. However, developing toward the saving of such waste has been going on, and we are now able to use this product by a process of shredding, digesting and beating in the production of low grade papers, and of heavy paper-box-board material, etc.

The utilization of the slash for this purpose requires, naturally, more equipment and more investment, but again, it is feasible, because it turns to use a product now considered as waste, and by the use of which, the better grades of fibre can be saved for higher grade papers and purposes.

All details necessary for use of slash material in paper making are at hand and can be supplied on request; and the use of slash for the ash and other bi-products is even now being practiced, while the use of fine branch-wood for fuel is a development which must necesarily follow the depletion of our forest areas.

When fire finds no place in woods operations of any kind, except it be fully confined, then, and only then, will the danger of forest fires be eliminated.

"The forests form one of the largest of the natural resources of Canada and one that has contributed largely not only to the general prosperity of the country but to the public revenues. Moreover there are extensive areas that will be productive only if they are used for growing forests. With these facts in mind it seems self-evident that it is the duty of every citizen to take an interest in the forests. The support of the Canadian Forestry Association is one of the channels through which every citizen can have a share.

"The Association has done splendid work in placing before the public the value of the forests and the means for protecting them and making them more valuable. The improvements in forest management in recent years are largely due to the work of the Association. It is in every possible way educating people to the necessity of preventing the fires which take such heavy toll from the forest every year, and is securing that co-operation in protection which must finally embrace every citizen of the commonwealth if it is to be successful.

"The Association's work will be successful in proportion to the strength and numbers of its membership and it deserves the support of every citizen who is interested in the prosperity of the country. The provincial governments derive large revenues from the forests and even if the object were only to keep up the public revenues and restrict the scope of direct taxation it would be deserving of the support of the tax-paying public."

June, 1916.

R. H. CAMPBELL,
Director of Forestry.

How to Build a Camp Fire

The Camp Stove Best when Transportable—Stove Constructon for Permanent Camps—The Use of Fire Irons

With the camping season due there come the usual questions on how to build camp fires. There are several varieties, most of them simple and effective and easily constructed even by a novice in camping. There must be considered not only the kind of camp fire which gives the best service but the kind which is least dangerous. The man who is careless with his camp fire should not be allowed in the woods for all too frequently he is responsible for forest fires which do tremendous damage. The Forest Service has issued a hand book for campers in which the following excellent instruction regarding camp fires is given.

Camp stoves should be taken whenever they can be transported. They are safer than open fires, more convenient, require less fuel, and do not blacken the cooking utensils. Collapsible sheet-iron stoves may be obtained.

In the absence of a stove an open fire must be built. A safe and serviceable fireplace can be made of rocks placed in a small circle so as to support the utensils. Where rocks are not obtainable, poles may be used.

For permanent camps it pays to build a stone fireplace. One is shown in the illustration. A piece of sheet iron will prevent the blackening of the pans and makes a better draft.

For temporary camps the fire should be built as follows:

Dig a hole about a foot deep and about three or four feet in diameter. Shovel away the side toward the wind. Lay green poles across the hole to support the pots and pans, and build the fire underneath.

Fire irons are often a great convenience. A piece of three-eighths-inch round iron four feet long is bent at right angles a foot from each end and the ends are sharpened. Two of these irons are placed side by side, the ends are driven into the ground and the fire kindled beneath them. Instead of being made in one piece, the pegs and cross-bars may be connected by rings in the ends. They will then fold and be easier to pack.

Camp fires should never be larger than necessary, and the utmost care should be taken to prevent sparks from being carried into the neighboring forest. Clear away the litter for a considerable space about the fire. And be sure to **put the fire out** before you leave it.

A shovel is nearly as important a tool as an ax in camping. Do not count on finding one along the way, but put one in your outfit.

During wet weather look for kindling in burned sugar pine or yellow-pine butts or in pine knots. The under side of a leaning tree will usually contain dry material. Dead branches—of manzanita, etc.—that have not yet fallen are drier than those on the ground. Bark from fir snags is excellent fuel.

Where matches are scarce or when the weather is stormy, first light a candle and kindle your fire from that.

Hints on fire protection are always timely and fit particularly well with these instructions about camp fires.

The first thing is prevention. Bear in mind the Six Rules. Be particularly careful with camp fire, matches, and tobacco, since carelessness with these is punishable by law.

Scrape all inflammable material from around the fire before lighting it. Make a fireplace either by digging a hole or by piling up rocks. The fire will then not only be safer but will draw better.

Before leaving camp see that the last spark is extinguished. Pour water on the embers and then cover them with earth.

Don't make your fire too large. Large fires are not as convenient to cook by as small ones and are more trouble to put out.

If you discover a fire, go to it at once and put it out if you can. A small fire can be put out easily by throwing handfuls of earth, sand, or dust at the base of the flame. The flames may also be beaten down with sacks or with branches, but care must be taken not to scatter the fire.

If the fire is spreading too rapidly to be attacked directly, cut and scrape a trail some distance ahead of it. Do not back-fire; this is work for an experienced man. If a fire is serious enough to require this treatment, the work should be left to a ranger.

The best tools for fire fighting are the shovel, ax, and hoe or rake. In open pine forest very little ax work will be required. Shovel or rake a trail through the needles down to mineral soil, and guard the trail.

To stop a fire burning in brush the trail must first be cut with the ax and then scraped. The brush should be thrown to the side away from the fire. The litter may be scraped toward the fire.

Pick a route for the fire trail that will avoid brush patches if possible. The crest of a ridge is an excellent location, since the fire naturally checks at the top.

Do not give up because the fire is gaining headway or because you lack tools. The fire has already been reported by lookouts, and rangers are hurrying to it properly equipped. Stay and help them; and in the meantime do what you can to keep it in check.

See that a fire is cold before you leave it.

Report all fires to the nearest forest officer.

Do not suppose that because a fire is merely burning in apparently worthless brush it is therefore doing no damage. Such fires are often the most serious.—"American Forestry."

Women in Wood Factories

As an indication of the shortage of men in various industries throughout Great Britain, it is interesting to note the following dispatch in the Timber Trades Journal of London:

"As compensation in some measure for the loss of the large numbers of men who have joined the colors, or who are about to be called up, women are now being recruited for the workshops, and everything possible is being done to utilize female labor until the end of the war. In our sawmill section this week we print a pamphlet issued by the Home Office and the Board of Trade giving particulars of the branches of the woodworking industry in which women may be substituted for men. There is always a certain amount of danger in a sawmill, as in many other industries, but in light employments such as those suggested, women will be able to tide over the shortage of labor until the war is over. For many years past women have been employed in box factories in London in the manipulation of light boxes, and it is surprising how adept at the work they become in a short time."

Ravages of Insects in Canadian Forests

In Valuable Limits, the Cost of Piling and Burning Slash is Offset by Saving from Insect Injuries

By J. M. Swaine.

In Charge of Forest Insect Investigations, Entomological Branch, Ottawa.

(Article Concluded from June Issue.)

The most serious insect-enemies of our forests are various species of bark-beetles. The adult beetles, usually less than one-quarter of an inch long, and brown or black in color, cut cylindric tunnels between the bark and wood of nearly all our timber trees. The eggs are laid along the sides of the egg-tunnels, and the grubs bore away from the egg-tunnels usually between the bark and the wood, and coring both. When green trees are attacked the liquid resin forms about the entrance hole to form a gum tube on the bark; and the trunk being girdled in hundreds of places by the egg-tunnels and larval mines, the death of the tree usually results within one year.

Many species of Bark-beetles attack badly weakened or dying trees or those recently killed; others occasionally attack and kill healthy trees, and commonly assist in the attack by more destructive species; these last, a limited number of species, belonging mostly to the genus *Dendroctonus,* are recognized primary enemies, readily attacking and killing the finest trees, and at times occurring in great outbreaks quite as destructive as a forest fire. I shall mention a few of these primary enemies.

Enemy of White Pine.

The Western White Pine or Mountain Pine, *Pinus monticola* is being kileld out, whenever it occurs in British Columbia, by the Mountain Pine Bark-bettle, *Dendroctonus monticolae.* Whenever we have found the Mountain Pine, from Vancouver Island as far east as Glacier Park, this beetle has been busy at its destructive work. There are very few valuable stands of white pine left in British Columbia and the chief agent in its destruction has been its inveterate enemy, the Mountain Pine Beetle. Unless control measures are undertaken very soon there will be no White Pine of timber size in that province.

The Western Yellow Pine or Bull Pine, *Pinus ponderosa* occurs in large forests over an irregular area in Southern British Columbia. For several years past a great outbreak of bark-beetles has been spreading throughout the Similkameen country. The present outbreak started apparently about eight or nine years ago about Okanagan lake, and has spread from the western slopes of the Gold Range as far west as Princeton and Nicola. A few days ago we received a report of the death of a large area of timber near Nicola Lake, and the valleys to the west of Merrit are threatened. In the districts longest affected, or where the beetles have spread most actively, all the pines, both yellow pine and black pine, are dead, and the country appears as though swept

by a great forest fire, except that only the pine has been killed; the Douglas Fir, spruce, and any trees in the stand other than pines are not affected. Over the greater part of the infested area the injury is evidenced by clumps and strips of dead trees with scattered dead trees here and there. In some sections the injury is extending very rapidly, while in others the spread is more gradual.

Growingly Serious.

Three species of beetles belonging to the genus *Dendroctonus* are responsible for this destruction. The most abundant is *Dendroctonus monticolae*, the Mountain Pine Beetle, already referred to, second in importance is *D. brevicomis*, the Western Pine Bark Beetle, and the third, *D. valens*, the Red Turpentine Bark Beetle, assists the other two destructive species. Minor attacks by these beetles also occur in the Kootenays. I have said enough to indicate that the loss from these attacks has been very great, and the injury is spreading and becoming more serious each year. There is the further danger connected with such bark-beetle outbreaks that fires may be started in the extensive areas of dead beetle-kileld timber, and thus obtain great headway. The control of these bark-beetles, not yet undertaken, would appear to be a most necessary measure for the southern interior of British Columbia.

The Black Pine or Lodgepole Pine, improperly termed Jack Pine, *Pinus murrayana*, is being killed extensively by the Mountain Pine Bark Beetle. It occurs in mixed stands with Yellow Pine and with White Pine and is killed apparently quite as readilv as its more valuable neighbours. Black Pine is attacked by an allied species, *D. murrayanae* in the Rockies, but no definite outbreaks by that species have been located.

Jack Pine, *Pinus divaricata*, is attacked in Northern Manitoba by *Dendroctonus rufipennis*, but no important outbreaks have been found.

The Eastern White Pine, *Pinus strobus*, is injured at the base by *Dendroctonus valens* as is also our Eastern White Spruce; but we have at present no extensive bark-beetle outbreaks to Eastern White Pine in Canadian forests.

The Sitka Spruce, *Picea sitchensis*, is attacked and killed by its common enemy, the Sitka Spruce Bark Beetle, *Dendroctonus obesus*. This beetle is killing small numbers of mature trees at various places on the Coast and on Vancouver Island; it is apparently more injurious in the Queen Charlotte Islands, although the dying timber there has not yet been examined. The Sitka Spruce Bark Beetle is an enemy well worth careful attention in spruce limits throughout its range.

Into Green Timber.

The Engelmann's Spruce, *Picea engelmanni*, in British Columbia, and Alberta, and the White Spruce, *Picea canadensis*, in northern British Columbia, northern Alberta and the Yukon, are readily attacked and killed by *Dendroctonus borealis*. This injurious species is everywhere abundant in slash and dying trees, from whatever cause, and has spread in recent years from the slash of clearings and trail cuttings to nearby green timber. Several such outbreaks in their initial stages, were located this summer in Northern Alberta and in Eastern British Columbia, and a similar outbreak has just been reported from Southwestern Alberta. The injury is showing in Glacier Park and in Field Park in several places. The early application of control measures will prevent more extensive injuries.

The White Spruce, *Picea canadensis*, is attacked in the Eastern Provinces by the destructive Eastern Spruce Bark Beetle, *Dendroctonus piceaperda*. During the last century there were several great outbreaks by this species in South-

eastern Canada, New York and New England, comparable to the bark beetle outbreaks by *monticolae* and *brevcomis* now raging in British Columbia and the Western States. In the several outbreaks billions of feet of the finest Eastern Spruce were killed and later largely destroyed by fires. There have been reports recently of small areas of dying Spruce in the Quebec forests, and these will be investigated this summer. Any evidence of the activity of this most destructive enemy should receive immediate attention.

Slash Burning a Help.

The Douglas Fir and Western Larch are attacked and killed by the Douglas Fir Bark Beetle, *Dendroctonus pseudotsugae,* everywhere throughout its range in British Columbia. Isolated dying trees and small clumps of red-tops indicate the injury in many places. There are at present extensive outbreaks by this beetle in our forests, but the aggregate loss from its attack on isolated trees is great. Probably all these losses would be avoided in operated limits by systematic slash-burning.

The Eastern Larch is attacked and killed under certain conditions by the Eastern Larch Bark Beetle, *Dendroctonus simplex.* Usually this beetle confines itself to slash or to completing the work of the larch sawfly by killing the trees weakened by defoliation.

In addition to these more destructive species, other species of bark beetles are each year responsible for the death of considerable quantities of Western Hemlock, Lowland or Grand Fir, (*Abies grandis*) in British Columbia, Alpine Fir (*Abies lasiocarpa*) in Eastern British Columbia and Western and Northern Alberta; and Balsam Fir (*Abies balsamea*) in Ontario, Quebec, and the Maritime Provinces. The aggregate of these minor injuries is very great, and in the case of the Eastern Balsam is particularly to be regretted since this tree is now being utilized for pulp wood. A large part of this loss could be averted on limits where lumbering operations are being carried on .

Control of Bark Beetles.

Although the bark beetles are so destructive they can be controlled effectively by destroying the broods of beetles in the area infested. Each of our destructive bark beetle species has certain characteristic habits, but in a general way the following statement applies to all. The adult beetles emerge in early summer from the trees attacked early the previous season and enter the bark of fresh slash or green timber in pairs through a round tunnel cut directly through the bark to the wood surface. When green trees are attacked a mass of gum-tubes, forms about the entrance hole and serves to distinguish the fresh "beetle trees" before the foliage changes colour. The female continues the entrance tunnel between the bark and wood as a vertical or winding egg-tunnel, along the sides of which she deposits her eggs at intervals, or in layers. The larvae bore away from the egg-tunnels in the inner bark or between the bark and wood, pupate in the ends of their "larval mines," and finally emerge from the bark early the following summer through round "exit-holes" cut through the bark. The winter is passed in the larval or in the adult stage in the bark of standing trees, logs or slash infested the summer immediately preceding. Dead trees are never re-infested. The general principle to be followed in their control is, therefore, to destroy the broods during winter in approximately 75 per cent of the infested bark, selecting the most heavily infested trees sot that approximately 75 per cent of the broods of beetles wil be destroyed.

If the infested limit is being logged, the beetle-infected logs are treated so as to kill the broods in

the bark by one of the following methods:

1. Put the logs in water in the early spring and leave them immersed long enough to kil the brods.

2. Saw the infested logs during winter and burn the slabs before spring.

3. If the infested trees cannot be logged with profit, but control of a beetle outbreak is necessary, the infested trees may be felled and the bark removed from the main trunk and burned if necessary, or the bark may be removed by barking tools from as much of the lower trunk as can be reached making particular effort to so treat the large and heavily infested trees.

The Case of Red-tops.

The old red-tops, killed the preceding or in previous years are never reinfested by the injurious species and are of no importance in the bark-beetle control; beetle killed trees and fire killed trees should be utilized the first winter following their death if the trees can be logged profitably, otherwise the timber will be greatly reduced in value or destroyed by boring grubs.

The slash from cutting should be burned between October and May. This alone will do much to check the increase of injurious insects in the limits. Many more or less injurious species as well as the more destructive species are found in the bark of tops, culls and slumps in immense numbers. If the slash from the winter's cut is piled and left to be burned during the following winter season, it will serve as a trap and **on a valuable limit the saving in loss from insect injuries should alone repay the cost of piling and burning.**

Injuries to Stored Products.

Camps made of unbarked logs are frequently infested by boring grubs. Building lumber on which part of the sapwood and bark have been left is sometimes found to be infested with boring grubs long after the building has been erected; in such dry wood the life time of the grubs is extended often to an extraordinary degree. Logs that are to be used in the unbarked condition for building purposes should be cut in the fall and piled loosely off the ground so that the inner bark may become well dried before the following June. Green lumber, bearing sap-wood and bark, should be avoided for building purposes.

Woods used for interior finish and for implements such as spokes of wheels and axe handles, are sometimes badly injured by powder post beetles. Such injuries have been apparently rare in Canada in recent years.

First Aid Instruction to Camps

Dr. M. J. Shields, of Washington, D. C., field agent of the first division of the American Red Cross, has be gun his campaign of safety first and first aid in the mills and logging camps of Oregon. This work will be along the lines carried on in the State of Washington during the past year where 100 camps have been visited and 8,000 lumber workers instructed in first aid.

This work in Washington has not only been the means of preventing a great number of accidents, but it has forestalled innumerable cases of infection and blood poisoning. Lives and limbs have been saved by men instructed in first aid work being on the spot when the accident happened with a knowledge and material for rendering efficient and prompt first aid.

IN BRITISH COLUMBIA'S FORESTS.

Felling a Giant, Twelve Feet in Diameter.

In the Forests of Queensland

There are three distinct and important lines along which the Queensland Government is moving in connection with the question of preserving the reserves of timber. The first is the reservation of timber lands. The second is the planting of young trees on those lands and the appointment of competent men as managers of the reservations. The third is the co-operation of the government, with the other states, in the establishment of a school for the education of special officers for the forestry branch.

At the present time the total area of land permanently or temporarily reserved for forestry purposes approximates 4,000,000 acres. A large number of small holdings are included in this total, as in earlier years, a great many large timber reserves were alienated, only small areas being withheld. The present government has adopted a sound policy to guard against the depletion of timber resources. Before any land is opened for selection, the Forestry Department, of which Mr. N. W. Jolly is director, is asked to obtain a report from its officers. This report will contain an estimate of the probable quantity of timber, and if the forest is considered good enough for immediate use, or to possess sufficient young timber, it is permanently reserved. The rent received last year was £74,700—nearly double the amount received six years previously, and five times the amount collected in 1906. The total expenditure on forestry last year was £7,650, but a considerable portion of the work is done by land agents and Crown land rangers, whose salaries are not charged to the forestry branch. The minister and the director, therefore, consider that if money could be made available it would be highly desirable that forest stations should be established in a number of districts. At present there are only three small forest stations in existence in Queensland—one at Atherton, one at Frazer Island, and one in course of establishment at the Brooloo State Forest. These, however, are very small establishments, which only form the foundation for future work. The minister's aim is to have a series of forest stations, where officers of the department will reside and manage the public estates.

One of the great difficulties in the way of the department, and one which emphasises the need for the establishment of forest stations, is the existing growth in forests of trees, weeds, or timber which is unsuitable. This hampers the department in the economic treatment of forests.

For several months past the various state governments of Australia have had under consideration the question of establishing schools of forestry. A conference was recently held by the directors of forestry in the different states, with a view to arriving at some scheme by which one school, at least, could be established in some central state. As a result of these negotiations, an executive minute was passed last week by the Queensland Government undertaking to co-operate with the government of New South Wales in the establishment of a school of forestry at Gosford (New South Wales). The government has agreed to pay for each student sent by Queensland a sum equal to the average cost per student. Queensland is to have the right to nominate a representative on any board appointed for the management of the establishment and the formulation of a curriculum.

War's Effects on the Forests of Switzerland

Mobilization Took Away Three-Quarters of the Swiss Foresters—A Soaring Market for Wood Products

(*Translated From "Revue des Eau et Forests."*)

War broke out exactly at a period of intense activity for the mountain foresters busy with the works of defense against avalanches, with the working out of plans of management and road projects, works which are carried out during the long days of the summer when the snow is gone and it is possible to travel easily in high mountains.

The foresters of the valleys were having some weeks of less intensive work after the operations of the spring and the commencement of the autumn work, and had gone to the National Exposition, of which the forestry section was the rendezvous for all the woodsmen.

The mobilization of our three classes of the army (Elite, Landwehr and Landsturm) took away from their duties three-quarters of the Swiss foresters, occupying in the army the most varied posts from the simple soldier or non-commissioned officer to the commander of a regiment. Those who remained at their civil posts had an arduous task, although in the month of October the depression in business was general and had its effect on the wood market. The mobilization coincided with the automatic stoppage of construction, especially in the cities where the nancial and economic crisis was and is intense. "When construction is not going on nothing is going on," they say in Switzerland. We have realized it in a serious way since the 1st August, 1914.

Big Cut of Fuel Wood.

At the end of September the public authorities feared that the supply of coal and oil would be short, for these combustible minerals come to us especially from Germany and Belgium. They, therefore, asked the foresters to cut great quantities of fuel wood, which was not very easy on account of the mobilization of the greater part of the fit men and by the departure of nearly all of the staffs of the Italian wood merchants who are our useful auxiliary foresters. As a matter of fact more fuel wood was cut than was necessary, for the coal arrived and still arrives more or less regularly, and the price has scarcely increased more than 10 per cent. In fact the market for fuel wood has scarcely increased, compared with that of 1913.

Few Government or communal forests delivered the usual quantity of timber, for it was known that there was no construction going on, and the foreigner was not at that time making demands upon our sawn wood.

However, at the beginning of the year 1915 an awakening took place in the timber market. This was caused by Italy, who, not being able to obtain from Austria the materials which she obtained from there in ordinary times, asked Switzerland for the stock of planks and timber that she could deliver.

Export to France.

After the disaster of Avezzano the Italians had recourse to Swiss production, and a large quantity of construction timber came through the Gothard and especially the Simplon. At that time, too, requests for treated posts came from France. It may be said that from the beginning of May the exportation of Swiss timber into France was organized on a large scale and that is gradually became greater, the price of certain kinds of sawn wood having increased from 50 to 80 per cent., compared wtih the condition of sales ten months before.

The Federal Government has restrained to a certain extent this trade, and in order to obtain equivalents in other materials the exportation of building timber is now governed by special formalities, and latterly the exportation of walnut, ash and other species, which our country cannot do without, has been prohibited.

The war has produced a complete upheaval in our timber market, for Switzerland was previously dependent on foreign countries and incapable of producing the building material which it used, and behold her now providing it fo rher neighbors on the west and on the south. On the other hand, Germany and Austria have almost completely stopped their exportation of wood materials into Switzerland, so that what is sent to France and to Italy is entirely of Swiss production; our statistics prove it, and we make a point of stating this to our French customers.

High Prices Offered.

At the moment of writing these lines the demand for planks, boards and other kinds of sawn material is so strong that even the smallest sawyers, especially of Romanic and Central Switzerland, receive visits from French merchants or their Swiss agents, who collect at any cost boards, paneul-wood, etc., often without insisting on a choice of which particular material they will receive. One readily pays at the present time for boards from 2 francs to 2 francs 30 per square metre, F. O. B., and lots of spruce logs in the forest are sold at public auction or by written tender from 20 to 30 francs per cubic metre, according to the distance from the nearest railway station.

If we look now at the market for wood of small dimensions that cannot be used as logs or posts we have a very interesting statement to make, and that is in direct connection with the production of paper. Before the war the pulp and cellulose mills obtained from foreign countries a large proportion of the raw material, and naturally a deficiency resulted a short time after the declaration of war. Then the manufacturers were obliged to tempt the owners of the forests by the most advantageous prices. In that particular part of the timber market the increase in price is from 20 to 30 per cent. The fact should not be overlooked that our manufacturers obtained six months ago public authority to prevent the export of fire wood, for the tenders from France seemed about to paralize that branch of our industry, and the manufacture of paper in Switzerland would probably have been ruined.

We other wood producers greet this development with legitimate satisfaction, for now our manufacturers of cellulose and wood pulp have discovered that they can obtain the materials they require in Switzerland on condition that they

offer prices slightly higher than those obtained for cubic metres of fuel. May this special production become more and more popular in operations where thinnings are made regularly on a large scale.

Oak Bark Soars.

Before the war operations in oak bark had fallen into disfavor, as our peasant woodsmen were receiving only from 8 to 9 francs per hundred kilograms f. o. b. In May, 1914, the price had reached from 18 to 20 francs, for importation from France and Austria-Hungary was suspended at the beginning of hostilities. We expect to see these prices rise still higher next season, but we have no illusions but that as soon as peace is signed, our life resumed and the open frontiers will allow commercial exchange, that our tanners will return to their old love and will turn to those who will give them tanning material at from 8 to 9 francs f. o. b. at a Swiss railway station. It is coppices of the Haute-Saone and neighboring regions that will profit by this, and all that remains to be done is for the Swiss foresters to continue the steady conversions into high mixed forest of our last traces of coppices, for do not let us forget that Switzerland should work to increase its forest area, which will make us less and less dependent on the output of foreign nations.

Prudence Points the Way

L. C. Boyle of Kansas City, filed with the Federal Trade Commission the first volume of his brief in the first important general investigation by this commission which contains in its analysis of the situation the following:

"European nations early recognized the need of adopting methods to avoid forest waste. With us, on the contrary, our splendid forest wealth has been needlessly squandered. Through error and lack of grasp, a greater proportion of our developing need passed from public to private ownership. This fault can not be answered or cured by placing the blame at the door of speculative greed. While we were evolving our political and industrial destiny, the majestic forest wealth of the nation remained unprotected and uncared for. This great national asset seemed limitless. The time has come when the dictates of prudence and a better understanding of national need impel a survey to be made of our remaining tree supply, to the end that a more rational national policy be worked out. Although we speak for the industry, it is our hope that the commission will feel and believe that our effort is in accordance with public interest.

Course in Logging Engineering

Arrangements for the course in forest or logging engineering at the University of California are completed and instruction will commence at the opening of the next college year in August. The course will require four years for completion, but all phases of the work will be taught from the start, so that any students who desire to shift from other lines of work may do so without delay.

The object of the course is to train men along lines somewhat parallel to civil, mechanical and electrical engineering, but specialized toward work in the lumber industry.—The Lumberman.

Classifying Lands in New Brunswick

Three field parties are now at work in New Brunswick, in connection with the forest survey and classification of Crown lands. The project is under the supervision of P. Z. Caverhill, provincial forester, subject to the general direction of the Minister of Lands and Forests. The size and importance of the undertaking is indicated by the fact that the Crown lands in this province comprise 10,000 square miles and return a direct revenue to the provincial treasury averaging more than half a million dollars annually from timber alone, in addition to large revenues from the sale of hunting and fishing privileges.

The best agricultural lands are naturally along the valleys, and it is here that settlement has, for the most part, been concentrated. In some cases, however, settlement has extended to the uplands. Some of these lands are well suited for agriculture, but in other cases the settlers have apparently been attracted primarily by the timber or by the desire merely to locate a home and have settled on lands not fit for permanent agricultural use.

There is considerable pressure upon the provincial government for the opening up of new lands, to provide for immigration and for the surplus native population. An important feature of the Act of 1913 was the provision for a classification of soils, with the object of directing settlement to lands really suitable for farming purposes. This wise provision is now being carried out, and the result will no doubt be to reduce to a minimum the location of settlers upon non-agricultural lands. The evil effects of such settlement may be seen in every province of Canada, and are due to the previous absence of a definite policy for the directing of settlements to lands realy fit for that purpose.

The province of New Brunswick has undertaken to avoid the recurrence of such tragedies as were discovered by the Commission of Conservation to have been enacted in certain portions of the Trent watershed, Ontario, where settlers were allowed to locate on poor, sandy soils, then chiefly valuable only for their timber. With the removal of the timber and the exodus of the lumbering industry, these settlers have been left stranded, with no opportunity to make a comfortable living, and faced with the necessity of constantly lowering their standards.

The work of land classification in New Brunswick is being carried on in connection with the timber estimate and mapping of Crown lands. The country is covered systematically and examinations of the soil are made at regular intervals. Beyond any doubt, the result will be the opening up of new lands for settlement and the establishment of new communities under conditions which will ensure comfort and a reasonable standard of living. This in turn will mean a permanent increase in the population of the province, by providing for the native surplus as well as for immigrants from the outside.

The Commission of Conservation has co-operated with the provincial government in laying the foundation for the land classification work, through the detail of several experts, who have just returned from an extended trip to the several localities in which the field parties are now operating.—C. L. in "Conservation."

A HELPING HAND

While the losses of members in many Canadian societies have been heavy during 1915 and 1916, the Canadian Forestry Association is moving steadily forward.

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The Experience of New Zealand

Sir J. G. Wilson, head of the New Zealand Agricultural Board, in dealing with the Dominion's timber supplies says: "It is common knowledge that the available amount of timber left in New Zealand will last perhaps 30 years, and at the most 40 years. Unless immediate steps are taken to plant considerable areas, future generations will have to import all the timber used. The government is doing something towards planting trees in a few districts in New Zealand. The whole of the present government areas might give six months cutting. When he came to the Ragitikei-Manawatu district in 1873 there was a fringe of open country which had been settled all along the coast up to and some distance beyond Wanganui. In the Wairarapa also the open country from Featherston to Masterton and out to the coast was settled. The rest of the country seemed illimitable bush. The seventy-mile bush ran up from the plain to Woodville, and the forty-mile bush from the gorge to past Dannevirke. The valleys of the Manawatu, Pohangina, Oroua, the upper reaches of the Rangitikei from Halcombe upwards were all bush, the whole of which is now cut down. Generally in the best timber areas the sawmiller was the pioneer, and the settler followed when the timber was cut out. Now there is not a sawmill in the whole of the area. I should not like to estimate the area that was in bush, but it must have been millions of acres. The Kauri forests are almost a thing of the past, Puriri scarcely procurable, and Totara very dear. The only source of timber for the North Island is the bush district in the central area, which cannot be nearly as large as that cut out. In the South Island there is still timber on the west coast, but more and more expensive to market, and the forests of Southland have been depleted. A recent forestry commission, which collected much valuable information, and made admirable suggestions in their report said, to meet our future requirements, we would need to plant 7,000 acres per annum. I doubt if we are planting even 700 per annum. Private individuals are doing a little. Already some plantations of soft wood have been cut

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down and sawed into timber for building purposes. We must have large quantities of soft wood, possibly poplar and the Douglas fir planted, and the eucalyptus for hardwood for the future. It is acknowledged in all countries that this should be the work of the government. The government must be impressed by public opinion of the necessity to find money for this object. It has been decided to form a society to further the matter."

80,000 Miles Travelled by 60 Rangers

How much ground well-disciplined forest rangers can patrol is shown by the record of the Lower Ottawa Forest Protective Association. During 39 days, between April 20 and the end of May, 1916, the sixty rangers employed by the Association covered 21,678 miles of trails and highways, along all of which distance they maintained a vigilant lookout for fires, and performed numerous other duties. This works out to an average of about ten miles per day of climbing along difficult tracks through forest country and must be considered an excellent performance. The rangers, of course, were far from being continuously on patrol, as in the 39 days they issued 350 permits to set-

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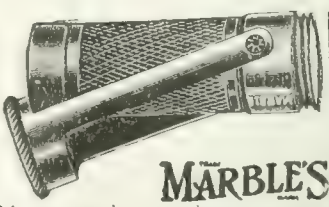

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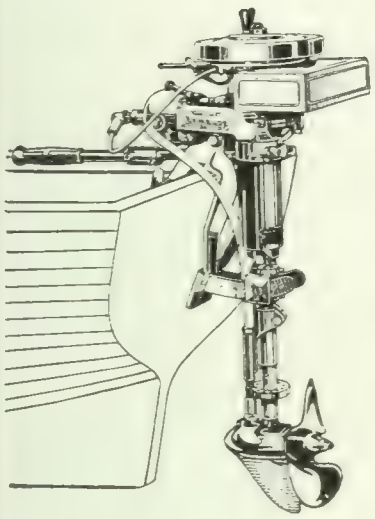

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tlers for slash burning and built trails, repaired 'phone wires, etc. Last year the Lower Ottawa rangers travelled 80,000 miles.

The fires encountered through April, and May were 10 in number, of which six were ascribed to railways, and one each to settlers, hunters, fishermen, and a sawmill.

Evidence of the good use of telephone lines in forest guarding is shown in the construction last season by the firm of W. C. Edwards & Co., Ottawa, of a line from Montcerf to their Tomasine Farm Depot, a distance of 23 miles, this line connecting with a rural line that has been in operation some time between Montcerf and River Resert, a distance of 14 miles.

Negotiations are under way by W. C. Edwards & Co. and the Gilmour-Hughson Company to take over the latter lines and further the building of the forest telephone connections to their Ignace and Bark

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Lake Depots. When the new lines have been constructed and connected with others at River Desert, a complete telephone service will be in operation between Ottawa and these important points.

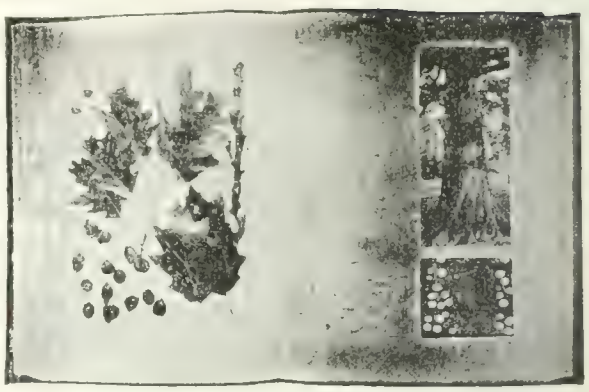
Good Results of Quebec Laws

During the last session of the legislature of Quebec, several amendments were made to the Fire Act, which are calculated to add materially to its strength and efficiency.

One of these provisions requires that settlers engaged in clearing operations must, between April 1 and November 15 of each year, secure a burning permit from an authorized forest officer before setting out clearing fires. Wherever this provision is properly enforced, it will undoubtedly bring about a very material reduction in the forest fire loss. One of the most serious features of the fire situation in all the provinces of Canada is the tendency of settlers to burn debris during dry periods, when fire is likely to spread and cause serious damage. A similar provision is urgently needed in Northern Ontario, where there is practically no control of settlers clearing operations.

Another amendment to the Quebec Act provides that the debris from settlers' clearing operations must, before burning, be piled in heaps or rows at a distance of at least fifty feet from the forest. On this basis, it is much more practicable to control the fire than where the old method of broadcast burning is resorted to.

Holders of timber licenses on Crown lands are required to clear away the debris on a depth of one



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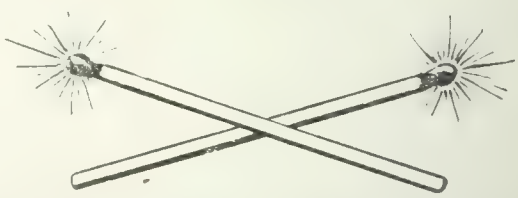

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hundred feet from railway rights of way. This is an excellent provision, but should be made applicable to privately owned lands as well. In many cases, the efforts of railway companies in the direction of fire protection are largely neutralized through the presence of large quantities of the most inflammable debris on lands immediately adjacent to railway rights of way.

Another excellent provision of the new Quebec Act is that any fire ranger or other forest officer may summon any male citizen between 18 and 55 years of age to assist in extinguishing any forest fire, the rate of pay being specified, and penalty being provided for failure to obey the summons.

The fire laws of the province of Quebec are among the most progressive in Canada, but larger appropriations are needed to make them fully effective. In particular, provision should be made for a larger staff of inspectors. The present staff is not sufficient to exercise proper supervision over the fire rangers on licensed lands, nor is there adequate provision for the protection of Crown lands not under license.—C. L. in "Conservation."

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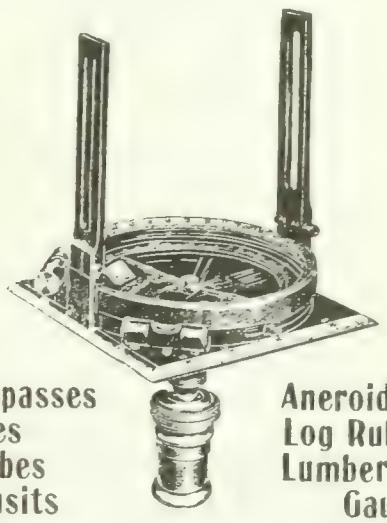

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Blind River, Ont.: "We have received two packets of booklets from the Association and will endeavor to distribute them as instructed."

Newcastle, N. B.: "We beg to acknowledge receipt of package of booklets dealing with forest protection. As requested by you we will distribute same to farmers, campers, railroad men and others."

Lethbridge, Alta.: "I beg to acknowledge receipt of booklets. We are distributing these where we consider they will do the most good."

From Sir James Outram, Vermilion, Alberta.

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"I shall be glad to become a member of the Canadian Forestry Association.

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after further experience during my camping trips in the Rockies, when mountaineering in 1901 and 1902, I have been particularly interested in the welfare of our timber inheritance and study of the problem when in the States, where I met Mr. Pinchot, has only added to this interest, so I thank you for this opportunity to join the Association."

On the Norwegian hills, the pine forests wage successful war with the bitter winds of the Pole; and in their sheltered rear the fruits of a milder climate ripen, and the toils of a happier land are carried on. Against the fierce storms of the Bay of Biscay, the pines of the Landes offer an effectual barrier; and meadows and pastures, forming the support of an industrious peasantry now appear where sand dunes once filled the air with their choking clouds, and spread desolation over the far horizon. The pine is, therefore, necessary to the equilibrium of nature. If ignorantly and wantonly removed from the situations where God has so wisely and graciously placed it, his benecent arrangements for the good of man would be completely frustrated."—Rev. Hugh MacMillan.

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Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

Campaigns for forest protection through its Publicity Department, the distribution of illustrated literature to settlers, campers, etc., the presentation of lantern slide cartoons in motion picture theatres, and many other methods calculated to bring practical results.

Holds series of illustrated public lectures on forest protection in various sections of the Dominion.

Issues an illustrated monthly, "The Canadian Forestry Journal," which goes to 3,500 members, and to 200 Canadian editors by whom it is quoted extensively.

Holds conventions in various sections of the country to discuss local and general forest problems, and to arouse interest in public forest policies.

A Free Cartoon Service is supplied to newspapers, also a free "cut" service, campaigning for forest protection through interesting illustrations.

These are a few of the concerns of the Canadian Forestry Association.

Support is entirely from voluntary sources. The Association is not identified with any Government or special interest whatever.

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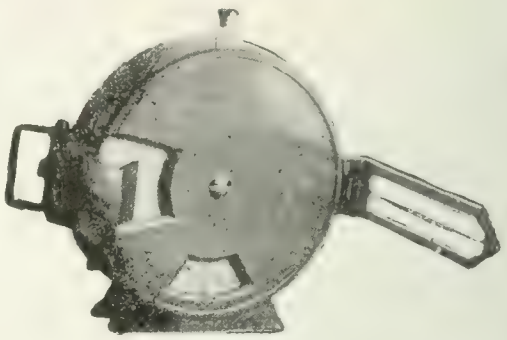

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Canadian Forestry Journal

VOL. XII

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AFTER THE FIRE HAD CLEANED OUT MATHESON.

Emergency shelters in which the remainder of the population lived. Coffins and boxes for some of the 135 bodies buried in Matheson's new cemetery may be seen.

GROUPS OF REFUGEES ABOUT ENGLEHART STATION.

Most of the settlers is the devastated districts will return to their homesteads, and, with Government aid, make a fresh start.

THE SCENE OF THE MOST DISASTROUS FOREST FIRE IN THE HISTORY OF CANADA. LOOKING OUT FROM MATHESON

The Searchlight on Ontario

A Frank Analysis of a Forest Protection System Maintained on an Outworn Model, With Suggestions for its Reformation

By Robson Black, Secretary, The Canadian Forestry Association, Ottawa.

In the face of the appalling forest fire tragedy in Northern Ontario, press and public are inquiring diligently as to the causes of forest fires, the methods of fire prevention, and are asking very frankly if the Provincial Government can entirely shake off responsibility for the heavy harvest of death and destruction.

The sacrifice of timber wealth, of entire towns, of maturing crops, has been a severe blow, particularly at a time when the guarding and developing of national wealth are accepted as keys to victory in the World War, but the conscience of the public has been far more deeply affected by the sacrifice of unreplacable lives.

The time to block forest conflagrations is, paradoxically, before they commence. Well-organized forest protection systems in British Columbia, Nova Scotia and sections of Quebec, as well as in the United States and Europe, have demonstrated the comparative ease of preventing fires from starting. After the fire is well under way, the same carefully organized systems can usually succeed in isolating the flames and greatly reducing the damage. Success in preventing and in fighting forest fires pre-supposes a condition of affairs to which the Ontario Department of Lands and Forests is yet a stranger. Nothing but a radical overhauling of the forest service of the province can give the people any assurance that 1917 will not witness a catastrophe even more violent.

In the first place, the forest service of Ontario is built on a very old model. While spending $300,000 a year on "protection" not more than a portion of that sum is represented in "value received."

The patrol of areas such as the "Claybelt" makes no pretense at thoroughness; educational work in fire prevention has been very slight, and the flimsiest provision made against such fearful onslaughts of flames as have now taken their ghastly toll.

Ontario, outside the Reserves, possesses very little equipment as telephone lines, trails, highways, lookout towers and cabins, such as are absolutely essential to any effective system of defence against fire.

Real "Rights" of Settlers.

One particular point of deficiency, emphasized by the recent fires, is in the ability to control settlers' burning operations. Quebec, British Columbia and Nova Scotia empower their fire guardians to penalize a settler who starts a clearing fire without written permission from a qualified ranger. In dry hot spells fires of all kinds may be absolutely prohibited in prescribed areas, and at all times, even of comparative safety, slash is piled properly or fire lines cut around the clearing. On-

tario takes no such precautions, although representations to that effect have been energetically made to the Government year after year. The settler is allowed to burn precisely as carelessness or ignorance may dictate and annual holocausts will remain possible until that "liberty" is sensibly curtailed.

The settlers going into Northern Ontario have a perfect right to demand that their lives and property shall be guarded by the Government to the best of its power. The recent fires doubtless helped to clear some land for agriculture, but for every acre so assisted, probably four or five acres of non-agricultural tree-growing land were affected disastrously. Certainly the danger of future fires has increased, as the areas of fire-killed timber widen, so that in a year or two, a mass of windfallen debris will present a perfect target for fresh conflagrations. If forest protection was needed early in 1916, to **prevent** the tragedy that has now occurred, it will be needed vastly more to offset a recurrence on a far worse scale in years to come.

If evidence were needed that the forest protection system of Ontario requires a far-reaching and determined overhauling, that evidence will be found in a perusal of the 1915 report of the Ontario Department of Lands, Forests, and Mines. Both by what the report states and by what it neglects to state, may be judged the wisdom of the Canadian Forestry Association's efforts to cause a re-organization of the Ontario ranger service, and place forest guarding among the creditable performances of the provincial government.

Two or three facts stand forth clearly: Neither the Ontario Government, the wood-using industries, nor the general public have more than a remote knowledge of the annual losses from forest fires. Only in patches of the forested area, mostly along the railways, is any consistent effort made to more than note the **number** of fires. The character of the timber destroyed, its acreage, etc., are immeasurably the most important features and under the present system are not reported on by the rangers and supervisors in anything even approaching an adequate way.

Why This Difference?

The Ontario limit holders are paying for their fire ranging considerably more than twice as much per acre as the limit holders included in the St. Maurice or Lower Ottawa Protective Associations of Quebec, although the protection afforded the latter is superior.

It is a well-established fact that railways, taken as a whole, are no longer the main source of timber losses throughout the Dominion. This is, to a very large extent, directly due to the increased efficiency of the railway fire protective organization, working under the regulations of the Railway Commission. These regulations impose stringent requirements in the direction of fire protective appliances on locomotives, control of right-of-way clearing operations, patrol of forest sections, action by all regular railway employees in reporting and extinguishing fires, etc. As a result of all this, both the number of fires caused by locomotives and employees and the amount of property destroyed is decreasing rapidly.

Having regard to these facts, note the representations of the Ontario Department of Lands and Forests, which should be an accurate and complete mirror of forest losses and their causes during the year under consideration, 1915.

Out of a total of 430 fires of all kinds, reported to the Department by its own patrolmen and rangers in 1915, 317 fires were reported by rangers patrolling just two railways

—both government-owned and operated—the Transcontinental and the T. and N. O.

The Private Owned Lines.

What about the record of the four other railways—non-Government-owned—in Ontario? The patrolmen on these lines are appointed direct by the companies, subject to the regulations of the Board of Railway Commissioners of Canada. A total of 110 fires was ascribed to the **railway zone** of the C. P. R., C. N. R., G. T. R. and Algoma Central, but only 59 of these were of "known railway causes," doing a total damage of $4,156.25.

With our attention focused upon the foregoing piece of information, that on the four company-owned railways in Ontario fires from "known railway causes" accounted for damage amounting to $4,156.25, and being anxious to learn the origin of the really serious timber losses sufficient by Ontario in an average year, we peruse the department's declaration that **57 per cent of all fires in Ontario forest lands in 1915 were reported by rangers patrolling the Government-owned railway lines.**

The year 1915 was, of course, a period of comparatively small damage by forest fires. Then what of 1914, a **bad fire year?** The Ontario Department of Lands and Forests declared that 95 per cent of all fires known to the Department were reported by rangers patrolling railway lines, though only 30 of these caused damage to timber.

A False Impression.

The impression given to the reader by these annual reports is wholly inaccurate. He would assume, naturally, that the railways were indulging in a carnival of destruction, whereas, by the Department's own figures, the "known railway fires" of four of the six railways, did a little over $4,000 damage to Ontario forest growth in 1915.

Resolving into the plainest possible form all the information received in 1915 in regard to Ontario's forest guarding we learn that:

One hundred and twenty-nine men, employed by the province to patrol the Transcontinental and the Temiskaming and Northern Ontario railways reported 317 fires, while the C. P. R., G. T. R., C. N. R. and Algoma Central reported through the twelve government inspectors 110 fires.

One hundred and sixty-six men on Ontario's forest reserves reported 52 fires.

One hundred and seven men on unlicensed Crown lands reported 61 fires.

Two hundred and eighty-six men ranging the Crown lands under license reported 56 fires, "37 doing no damage."

On the face of this showing, 559 rangers, working in districts back from the railways managed to report about half as many fires as 129 rangers working along **two** public-owned railway lines.

These figures, undoubtedly, are not capable of disclosing more than a confused fraction of the actual story.

Who will credit for a moment that 95 per cent of the forest fires in Ontario in 1914 originated within the railway zones? or that 286 men **diligently** patrolling 10,000,000 acres in 1915 could discover only 19 fires causing damage? or that 107 men can give even the shadow of real protection to 50,000,000 acres of unlicensed Crown Lands containing more or less merchantable timber?

A Few Explanations.

How, then, are these puzzling pieces of information to be accepted?

One obvious explanation of the high percentage of timber losses **ascribed** to the railway zones is that railway patrol is intensive and fairly well supervised. On the Trans-

continental and Temiskaming and Northern Ontario lines (Government owned) the rangers are paid by the province and are hence under closer control.

The meagre information concerning losses on unlicensed lands is the reasonable product of a small staff of rangers, plus poor supervision.

The failure of the Government statistics from licensed lands to uncover more than a small part of the annual fire record proceeds from the fact that rangers on the berths are not paid by the province but by the licensees and therefore not subject to the same degree of control. In addition, the supervision of these men is such as, applied to a modern manufacturing plant, would breed laxness and waste at every turn.

Perhaps the most important of all explanations is that Ontario is the only province owning a large area of Crown Lands which does not require all rangers to submit individual reports of each fire on special forms. The Department depends upon the vague, happy-go-lucky and incomplete entries in the rangers' diaries which are not turned in until the end of the season. The rangers' diaries pay little attention to the really important information connected with forest fires—the extent and character of destroyed areas. This system may give the Department some knowledge of the **numbers** of timber fiires, but is an entirely unreliable index of the annual loss.

The Timber Berths.

The reader will not require more argument than a reproduction of the Department's own statements to recognize a very pronounced lack of business efficiency on the timber lands under license. **Eight supervisors only were made responsible for the inspection of 286 men.** The meagreness of this managing force is a bid for poor discipline. Ontario has about 10,000,000 acres under license by lumber and pulp companies. The cost of patrol and fire fighting is borne entirely by the licensees. The salaries of the eight supervisors appointed by the Government, are also paid ultimately by the licensees. This 10,000,000 acres represents, obviously, the most accessible and valuable timber remaining to the province. Yet in providing protection against fire, the Government, as trustee, requires the eight supervisors to assume the direction of an average of 36 men each. The Ontario Government in the Mississaga Forest Reserve gives four supervising officers to 40 rangers and this ratio of one officer to ten men is the least that can be done without throwing efficiency to the winds. Eight supervisors cannot get the maximum service from 286 men over such an immense territory as 10,000,000 acres, and the best proof of this statement is the annual report of the Department of Lands and Forests.

Is 300,000 Adequate?

Ontario spends over $300,000 annually for forest patrol, including expenditures by the province and by limit-holders. Is this adequate?

The inadequacy is not in the amount expended, but in the thing it buys. Money can be wasted with as much facility in a forest as in a town. Ontario is not getting, by any means, all that it is paying for in the way of forest fire protection.

The best protected forest area in Eastern Canada is probably the 24,000 square miles in Quebec under the care of the St. Maurice and the Lower Ottawa Forest Protective Associations. These were organized by limit holders on business lines, with competent managers, and a plan whereby one inspector is assigned to about ten men.

Their patrol, including time and money spent on building lookout towers, trails, camp fire places, repairing telephone lines, etc., costs

about a quarter of a cent per acre per year. Relatively speaking, the results are excellent, and justify a much heavier expenditure for a correspondingly more complete fire protection service. With the expenditure per acre incurred in Ontario, practically complete protection from fire can be secured.

At a quarter of a cent per acre, the entire 10,000,000 acres said to be under license in Ontario could be patrolled for $25,000 and patrolled about as thoroughly as the lands of the private associations in Quebec. The Ontario licensees now pay $70,000 annually for a protective service that, frankly speaking, **is not in the same class.** The Quebec associations are far from full-grown, but they avoid at least the costly overlapping incident to the "every man for himself" plan to which the Ontario licensees are bound. Some of the Ontario licensees pay as high as $5 per square mile for fire patrol per year. The highest assessment yet made against the members of the St. Maurice Forest Protective Association in Quebec is $1.92 per square mile, but that low rate is obtained by unification of ranger control, the mapping of patrol districts on economical and proper lines, and improved methods of communication and transportation, through the construction of trails, telephone lines and loookut stations. In Ontario, however, every licensee shifts for himself. Co-ordination of patrol service is practically unknown, and the limit holder pays dearly for a small degree of protection, or sometimes fails to get it at all on account of the fire ranger being used primarily for other work. Apparently only in the parks and in some of the reserves has even a small beginning been made in the construction of trails, telephone lines and lookout stations. And yet this mechanical foundation is absolutely essential to any well-organized forest fire protection service. Surely the interests of the wood-using industries of present and future demand that the Ontario Government **organize** the licensed lands for patrol purposes. It does not seem an exaggeration t predict that if such action were taken, the amount of protection to the best timber in the province would be quadrupled, without a penny of additional cost to either licensee or taxpayer.

On Unlicensed Lands.

The situation on unlicensed lands is far worse than on licensed lands. The Dominion Forestry Branch estimates that Ontario has 70 million acres of land, containing more or less merchantable timber, in addition to a very large area which is relatively non-productive on account of muskeg, repeated fires, climatic conditions, etc. Of this probably about 20 million acres are included in forest reserves, parks and timber limits, leaving something like 50 million acres of unlicensed Crown timber land not included in parks and reserves, and exclusive of non-productive areas such as muskegs, lakes, areas repeatedly burned, and lands too far north to produce timber of commercial value. On this vast area, there is a very large amount of merchantable timber, largely pulpwood, which has not been placed under license on account of relative inaccessibility to transportation or for other reasons. Enormous quantities of timber have been destroyed by fire, and great areas have been rendered unproductive by the great conflagrations which have swept over them time after time.

Each year, lands under license are surrendered by the limit-holders, usually because the timber has been cut out. In other cases, the area under license is reduced because of failure of the limit-holder to pay ground rent or stumpage dues. To a certain extent, these losses are made up by the issuance of licenses

Looking toward the railway cut at Nushka, where on Saturday, July 29th, fifty-four men, women, and children attempted to take refuge and were smothered and burned to death.

covering new areas. However, for years past, there has been a steady decrease in the total area of Crown lands held under license. The reports of the Department of Lands, Forests and Mines show, for instance, that in 1912 there was a net decrease of 996 square miles from the total area under license in 1911. The reduction in 1913 was 891 square miles and in 1914, 184 square miles. In 1915, the reduction was 1621 square miles.

The rapidity with which cut-over lands in Ontario are being surrendered to the Crown is shown by the statement of the Department that 307 square miles were surrendered, as cut out, in 1912. In 1913, 1914 and 1915, the areas so surrendered were 257, 1,111 and 602 square miles respectively. New licenses were issued in 1913, 1914 and 1915 covering 100, 500 and 312 square miles respectively.

A Losing Deal.

It is perfectly obvious that unless the burned-over and cut-over lands, including those surrendered by license holders, are allowed to restock naturally, so that they can in the course of time be cut over again, the lands fit for cutting and of reasonable accessibility will ultimately become exhausted or approximately so. When the pinch begins to be felt, to the extent that new areas of merchantable timber, of suitable accessibility to transportation, can not be located for the issuance of new licenses, there will be an increasing tendency toward the reduction of the forest revenue of the province. During the past ten years, these revenues, which go into the provincial treasury and relieve direct taxation to that extent, have averaged

between a million and a half and two million dollars annually. During 1903, 1904 and 1905, due to the extensive sale of new timber limits, they ran well over two million dollars annually. Since Confederation, in 1867, and up to October 31, 1915, the total revenue which the provincial treasury received from Crown timber has been upwards of $52,850,000, an average for 48 years of more than $1,100,000 annually.

In order to hold up provincial timber revenues, it is essential that new areas of timber suitable for cutting be constantly available, to replace areas surrendered as cut out. To safeguard this situation, it is absolutely essential that there be an adequate system of fire protection on unlicensed Crown Lands as well as on those under license. Any other policy will mean an ultimate decrease in the provincial timber revenues, as well as shortage of supplies for the many hundreds of wood-using industries in the province.

Yet, notwithstanding the above, we find, according to the report of the Department for 1915, that only 107 fire rangers (paid by the province) were assigned to the protection of the 50 million acres of unlicensed and unreserved Crown Lands containing merchantable timber, as compared with 286 men (paid by the licensees) for the protection of the 10 million acres of land under license. That it is impossible for this relatively small body of men to afford even partial protection on more than a small percentage of such a vast area goes without saying.

Thorough-going Action.

The situation in Ontario calls urgently for a complete reorganization of the whole fire-ranging system along modern and up-to-date lines, with adequate attention to the protection of unlicensed Crown lands as well as forest reserves and parks and lands under license. The Department of Lands and Forests of Ontario is entitled to the credit of having been the first governmental agency in Canada to recognize the necessity for an organized system of forest fire protection. In 1885, a beginning was made in the organization of a fire-ranging service on licensed lands, and in succeeding years this organization has been developed and extended. However, on the whole, the organization has not kept pace with modern developmnts in some of the other sections of Canada or in the United States. The lack is very largely one of organization and supervision, both in the head office and in the field. The amount of money now being expended is sufficient, if handled according to modern business standards of organization, to provide a very much better degree of fire protection than is now secured. H. R. MacMillan, Chief Forester of British Columbia, has stated that more money is wasted in fire protection today than is used economically, because of lack of field supervision. The fire protection situation in Ontario is an illustration of this undeniable fact.

Holders of Burning Permits Liable

In the State of Washington the holding of a burning permit does not relieve responsibility in case the fire spreads beyond control and endangers the property of others. On June 13, Culliton Brothers who are constructing three miles of the Scenic Boulevard near Everett, lost control of a slashing fire which destroyed a 600-foot logging chute belonging to the Haybrook Lumber Co. The county commissioners and engineer have decided to withhold $1,714.04 from the contract price of the road. An amicable understanding was reached by the fire warden, state officials and Culliton Brothers at a meeting in Everett on June 23. Settlement was made without expense to the state.

New Brunswick's Business Plan of Land Classification

An Interview with Mr. F. C. Nunnick, Agriculturist of Conservation Commission Guiding the Settler

The wisdom of classifying the lands of a Province and utilizing them according to the plan of Nature would seem self-evident. Only in very recent times, however, have matter serious attention, and even now the idea has not been adopted as an invariable policy. The lapses and incongruities are to be seen on every hand, playing false to the public good, and burdening the state with pitiful and costly problems in present and future.

New Brunswick, however, has made an excellent start at surveying the provincial domain, and learning the soil possibilities of section by section, as well as compiling a record of the timber resources. The Government of New Brunswick recently received the aid of Mr. F. C. Nunnick, Agriculturist of the Commission of Conservation, for several weeks field work, in order to advise the government as to methods of procedure in land classification. Following is an interview with Mr. Nunnick, given to the Forestry Journal:

Quality of Soils.

"We visited only a small area in the short time at our disposal. The foresters in connection with the Forest Survey, however, will continue to do what they can in connection with land classification. In order to make a thorough classification of soils, a soil man should accompany each party to see for himself the types and quality of soil and laboratory tests should be made of samples of the various types. Of course, much can be done by the foresters who obtained some information from us, as they accompanied us on our trips. We made out a circular of instruction to be given each party regarding the classifying of soils, taking of samples, etc. We began our work at Weaver's, a small station on the I. C. R., not far from Doaktown, and found here a very poor agricultural soil, some of the settlers having been on this land from twenty-five to thirty years and only having small clearances made in that length of time. These men work in the woods in the winter time and part of the summer and simply use the land to grow a few potatoes and feed for their team and the few cows which they keep. These men stated that the land produces poorly and that the production has decreased since they first began cropping it. The method of farming conducted by these men—that is, with so little live stock—is not conducive to permanent soil fertility. Much of the soil we visited on our various trips is hungry, and if used for agriculture, would need to be fed right from the start, that is, clover crops ploughed down or farm-yard manure should be applied. We found also that where farming is being done and has been carried on for many years that the crops best suited to the land are not being grown. Much of the soil needs liming, and just here I would like to suggest the advisability of illustration work of this kind being carried on in the new districts as

well as in the old. In the older districts illustrations in connection with soil renovation should be conducted, while in the new districts, tests should be made to ascertain what the land is best suited for and what crops it will grow most profitably.

Would Bar Settlement.

"Some of the land we visited is absolutely unfit for agricultural purposes and should never be opened for settlement. As an example of this, the land behind the row of lots granted on the Miramichi river, south of Doaktown as far back as Cains river, is a light sand. The duff or leaf mould is thin, being in most instances only two or three inches in thickness underlaid by several inches of white or gray sand underneath, which is brown sand which runs down considerably below plough depth. This is suited for forest growth only and should never be broken up for any other crop. In other sections, we found a fairly good agricultural soil, and in some sections, a very good agricultural soil. In the Pleasant Ridge settlement, north of Boisetown, we found a fair agricultural soil. It needs good management, however, and intelligent treatment. South of Boisetown again, after leaving the granted land and on back to Cains river, we found the gray and brown sand again constituting a soil unsuitable for agriculture. On one hike out from camp No. 1, which was situated on Halesbrook, we went in a south and southwesterly direction for a distance of six or seven miles and found good agricultural soil. I am merely citing these as examples to show you that in some places there exists soil unsuitable for agriculture, and in other places, land which could well be used for farming purposes. We also found another condition which it might be well to mention—that is, of small, isolated valleys which might contain fair or very good soil, but the restricted areas and the difficulty encountered in reaching these small areas makes the wisdom of opening them very doubtful, indeed. Again, we found some areas where there has been fire and where the soil is only fair and where no profit can come from the forests for many years. The opening of these areas for agricultural purposes is debatable, as the land sometimes is of an indifferent quality and it would depend, I imagine, on how urgent is the need for farm land.

Needed Everywhere.

"I am convinced that the need for land classification ahead of settlement is very great and that it would be greatly in the interests of the settlers if such could be carried on everywhere in Canada where land is being opened for settlement.

"In some places we also found the soil so filled with rocks and boulder stones that a man and his children would be gray-haired before they could all be cleaned out in order that the land might be easily tilled. In fact, I heard one man make the statement that he had so many stones on his farm that he found it necessary to rent land from a neighbour on which to pile them. There are many problems that the settlers have to contend with which an outsider can scarcely fully appreciate, but you cannot emphasize too strongly the advisability of an examination of the land before it is allowed open for settlement. After having spent some weeks on this work, I am more firmly convinced of this than ever.

Fire Damage.

"I might just remark in passing that on one large burned-over area adjoining Cains river, about thirteen miles south of Doaktown, the duff had practically been all burned off and the white or gray sand was showing over the whole area. The second growth of pine (red, white and Jack pine) was making a very good growth, but it stands to reason

that where some of the duff is left or has not been burned off, it would very much assist in holding moisture during the dry season of the year, which would assist materially in the more rapid growth of the young trees. Wherever I had the opportunity to talk with settlers who were clearing land, I strongly advised them to do their burning carefully and to burn as little of the duff as possible, because when breaking, the mixing of the duff or leaf mould with the under-soil adds humus, which is necessary to make a soil productive. If the burning can be done in the spring while the duff is wet and the slash dry enough to burn, it would seem the wiser plan."

The Man Who Named the Douglas Fir

Adventurous Life and Terrible Death of David Douglas; Introduced 217 Plants to English Gardens

Douglas was the family name of Lord Selkirk, founder of the Red River Settlement, and it was the name of other men who have been prominent in Western Canada, so that considerable doubt exists in the popular mind as to the particular man after whom the famous Douglas fir was named. It is found that it was not named after a founder, governor, or chief justcie, but after a remarkable man in a humbler sphere of life. It should also be noted, too, that while the name of Douglas will always be associated with the common name of this magnificent tree, yet the scientific name fails to show any connection. It is called scientifically Pseudotsuga, literally, false hemlock. It is not false hemlock. It is a much finer tree than any hemlock, and it is to be hoped that a later generation of botanists will change the name and give Douglas a place in it.

Regarding Douglas, Dr. Charles S. Sargent, Director of Arnold Arboretum at Harvard University, has this to say of him in a footnote in his famous work "Silva of North America":—

"David Douglas (1798-1834) a Scotch gardener sent by the Horticultural Society of London to explore the forests of the Northwest Territory, is, from his courage, energy and success in the presence of great difficulties and dangers, and from his untimely and horrible death, a conspicuous figure in the annals of American botanical exploration. Douglas, who had been trained by Sir William Hooker, and had made a short botanical journey in Eastern America in 1823, was sent, in 1824, by way of Cape Horn to the Columbia River, where he arrived in April, 1825. He spent two years in Oregon, discovering some important trees, including Abies nobilis (noble fir), Abies amabilis (Lowland fir), and Pinus Lambertiana (sugar pine) the largest of its race.

In March, 1827, Douglas started from Fort Vancouver, on the Columbia River, crossed the continent by Hudson's Bay Company posts, and embarked for England, which he reached in October of the same year. Two years later he left Eng-

land for the last time and reached the mouth of the Columbia on June 3rd, 1830, remaining in Oregon until the autumn, when he sailed for Monterey. Here he remained until the next summer, discovering no less than a hundred and fifty species of undescribed plants, and then sailed for the Sandwich Islands. In the autumn of this year he returned to the Columbia River, and in the following summer extended his explanation as far north as the Fraser River, in which he was wrecked, losing his collections and instruments, and barely escaping with his life. But the beauties of tropical vegetation lured him from the awful solitude of the sombre fir forests of the northwest, and in October, 1833, he sailed again for the Sandwich Islands. Here he passed the winter, and on the 12th of July, 1834, while engaged in exploring the high peaks of the island, he fell into a pit in which a wild bull had been captured and several hours later was found dead and terribly mangled.

"Douglas is said to have introduced two hundred and seventeen species of plants into English gardens, the list including many valuable and beautiful trees, like the Redwood, the Sugar Pine, and the Douglas Fir. No other collector has ever reaped such a harvest in America, or associated his name with so many useful plants. By an unfortunate hazard of rate the noble Douglas Fir, the most important timber-tree introduced by Douglas and one of the most valuable trees in the world, does not, as might well have been the case, perpetuate his name in the language of science, and it is a humble primrose-like alpine herb which commemorates this explorer of forests and discoverer of mighty trees."

Canadian Paper in U.S.

In reply to a criticism at the recent newsprint "combine" investigation at Washington, Philip T. Dodge, president of the International Paper Co., made the following statement:

"It has been the boast and is the policy of the International Paper Company that no publisher having a contract with it shall ever suffer by reason of fire, flood, interruption of railroads, strikes, or any other interruption under which the company might claim exemption from its contracts to furnish paper. Although it is the policy of the company to keep from 37,000 to 40,000 tons in storage, at present the reserve is down to about 17,000 tons. There has been an abnormal demand for newsprint paper. Our mills are and have been operating at maximum capacity, twenty-four hours a day and six days in the week. We make one-third of the newsprint paper in the United States; one-third is made in Canada, and the rest by companies with which I have no connection. The unjust laws of the United States are sending the newsprint business of the United States into Canada. A few years ago there was an investigation of the paper business by a tariff commission, which found that the Canadians had an advantage of about $5 a ton over us. Yet Congress, when it came to consider that report, placed newsprint paper on the free list ,thereby increasing our disadvantage. At the time newsprint paper was placed on the free list fifty tons of paper were being imported from Canada every day. At present the importation amounts to 1,000 tons."

The General Fire Situation

Reports received from railway fire patrolmen in Ontario refer to the gratifying immunity from serious forest fires along the lines under regulation by the Dominion Railway Board. The last week of July, which did such damage in the Clay-belt, was responsible for insignificant losses in timber along the private-owned lines, although patrolmen reported some apparently severe fires working toward the tracks in places. Who can doubt that the favorable railroad record at such a period is largely due to efficient, well-supervised patrol?

Reports received by the Association from the 12,000 square miles of territory in Quebec patrolled by the St. Maurice Forest Protective Association indicate an excellent record thus far. While the rangers have had a number of fires to fight, the areas burned have not been extensive. The value of preventive work has again been manifested. Many fires have been encountered at the edge of the St. Maurice territory, originating beyond its borders, and these have given trouble. Rain fall has been heavy in Quebec this year.

Twenty-five fires have been put out on the Lower Ottawa Forest Protective Association's limits. Most of them were on old burns where young growth had barely taken hold. Berry pickers were undoubtedly the cause of some of the fire trouble, due to unextinguished camp fires. One fire was fought at Chelsea; as far as can be learned it originated with a cigarette thrown from a vehicle passing along a highway. Little trouble with settlers' fires has been encountered on the Lower Ottawa Association's areas this season. Vegetation was unusually heavy and dampened ground fires effectually.

A report from Fredericton, N.B., states that no serious fires have been reported during July on the Crown Lands of New Brunswick.

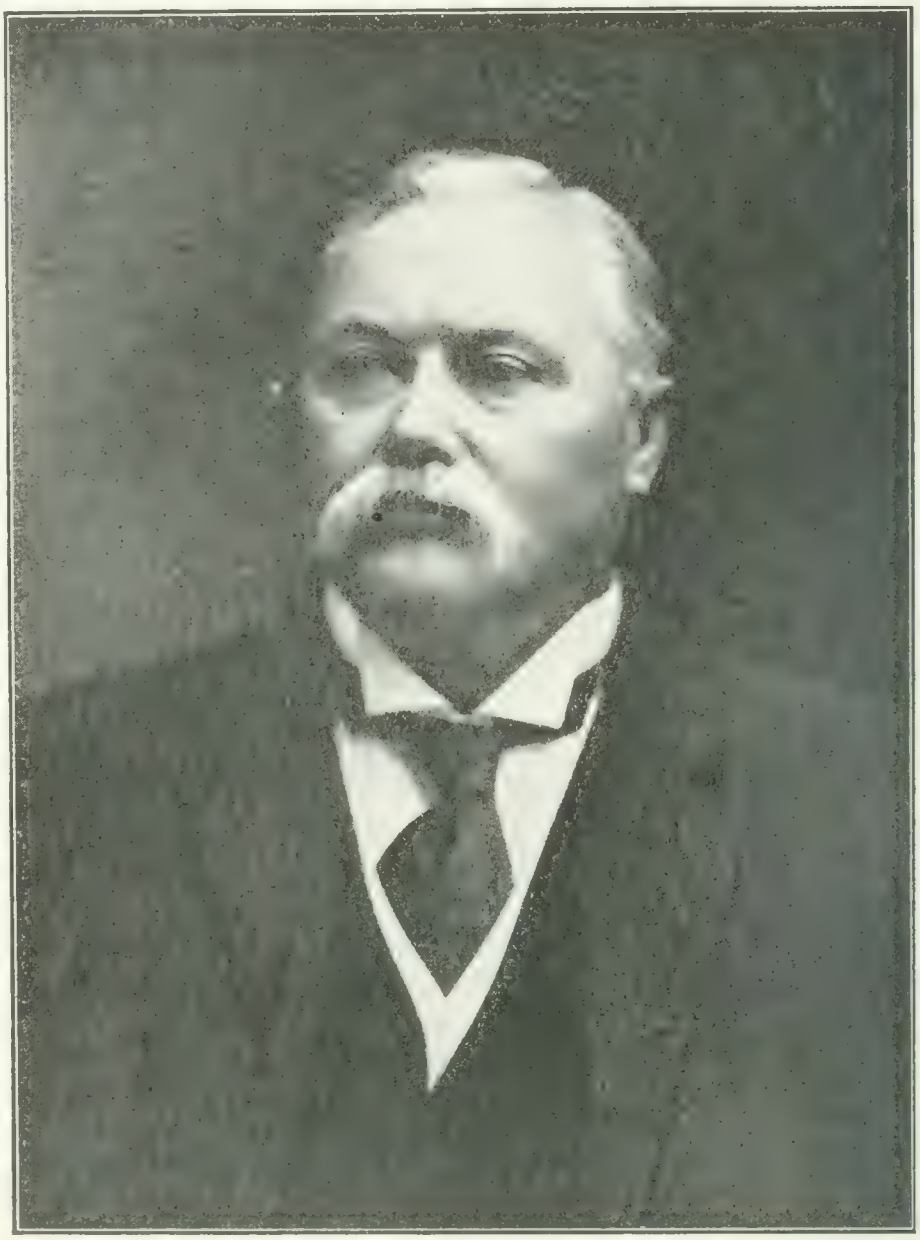
Protection of Trees

In many cases, when running wire fencing, it is advisable to attach it to trees, instead of setting down fence posts to carry it. If the fencing is attached directly to a growing tree the wire is soon overgrown and embedded in the wood, injuring, and, in many cases, killing the tree. To fasten the wire fencing to the tree, and at the same time protect it from injury ,a strip of board, an inch or an inch and a half in thickness, and three or four inches wide, should first be securely nailed upright to the side of the tree. The fencing should then be fastened by staples to this strip. In this manner very little damage is done to the tree, and the wire fencing may be removed at any time.—(Conservation.)

An Important Move by N.T.R.

Arrangements have been made wit hthe National Transcontinental in regard to the patrolling of their right of way through the territory of the St. Maurice Forest Protective Association by which the railroad will pay one-third of the cost of the labor and will pay for gasoline and oil consumed by the power speeders, the Association and the Province dividing the balance of the cost.

A special uniform has been provided for all the St. Maurice rangers this year in the form of a green shirt, with "Protection Forest" in red letters across the chest.



THE LATE JOHN HENDRY, Vancouver,
President of the Canadian Forestry Association, 1912-13.

The Late Mr. John Hendry

The death in Vancouver on July 17th of Mr. John Hendry leaves a great gap in the lumbering and forestry world. Mr. Hendry, born in New Brunswick seventy-two years ago, went as a young man to the Pacific coast long before the first Canadian transcontinental railway was built. He lived at first at different places on the Pacific coast, and even went as far east as Winnipeg, but in all his work and travels his mind was centred on British Columbia. In those days there was, of course, no Vancouver, and his first business location was Nanaimo, and, later, New Westminster. Where the centre of population and business activity was, there was Mr. Hendry, and his acumen and energy soon made him one of the leading men of the province. When Vancouver was located as the terminus of the Canadian Pacific railway Mr. Hendry and his associates extended their operations to, and eventually centred them in, that city. When the great fire of 1886 swept Vancouver off the map, Mr. Hendry and those associates, Mr. McNair, Mr. Beecher and Mr. R. H. Alexander, cleared out their big lumber sheds and for some weeks housed many of the homeless therein. They also generously distributed lumber to help the stricken citizens to rebuild. Mr. Hendry was not only in the community, but of the community, living its life and helping it forward in every way, and the citizens of Vancouver never forgot the part he played.

How he built up one of the greatest lumber-exporting businesses of the whole Pacific coast is well known to all Canadian business men, and here it is necessary only to point out that, busy as he was with his many concerns, he was always active in promoting the interests of his fellow citizens in the capacity of leader and representative. In New Westminster he took a deep interest in civic affairs, and, besides serving in other capacities, was mayor and president of the Board of Trade. He was later president of the Vancouver Board of Trade.

His Services In Forestry.

He was president of the Canadian Manufacturers' Association in 1910, and in crossing over to Europe on business connected with that organization, in doing some service for a fellow passenger, he slipped on a rug and broke both legs badly at the hip joint. He was attended by the ship's surgeon, but, the remainder of the voyage being rough, the bones did not set properly, and, though given the best medical treatment in England, he was never again able to walk without the greatest difficulty, and only with the aid of walking sticks. As Mr. Hendry was a big and portly man, and one who had in earlier years been full of bodily activity, this limitation was a great drawback to him. Nevertheless, he persisted in attending to business, which involved frequent and long journeys and in carrying on work of a semi-public character when many other men would have become luxurious invalids.

Mr. Hendry was president of the Canadian Forestry Association in 1912, and it was during his term of office and because of his enthusiasm that the Victoria Convention was held in that year. This Convention coincided with the introduction of the new forestry program by the

Government of the Province of British Columbia, and it was therefore one of the most important meetings ever held on the Pacific coast. From England by cable Mr. Hendry directed the work of preparation in the early part of the year, and at the Convention he presided and pushed things through to a most successful conclusion.

A Great Organizer.

Mr. Hendry had that sure touch of a great organizer and captain of industry—he was always able to pick out and surround himself with associates who had dropped the word "fail" from their vocabulary, and the result was the great organizations which they jointly built up on the Pacific coast.

He was a man of generous instincts, and was never happier than when surrounded by his friends at his stately home in Vancouver or on his steam yacht among the beauty spots of the Gulf of Georgia. He is survived by his widow and one daughter, Mrs. Eric Hamber, who, with his other relatives, have the sympathy of many friends both in this country and in Europe.

Fire Protection on the Railway Lines

Satisfactory progress was made during 1915 in the railway fire protection work, which has been handled during the past four seasons under the regulations of the Board of Railway Commissioners. The co-operation of the various federal and provincial fire-protective organizations has been given freely, and, with very few exceptions, the railways have also co-operated heartily and effectively.

A total of 686 fires in forest sections is reported as having originated within 300 feet of the lines of railways subject to the Railway Commission's jurisdiction. Of these, 43.4 per cent are definitely attributed to railway agencies, 27.8 per cent to known causes other than railways, and 28.8 per cent to unknown causes. Of the total area burned over, amounting to about 37,263 acres, 33.1 per cent is chargeable against the railways, 20.9 per cent to known causes other than railways, and 46 per cent to unknown causes. The total damage done is estimated at $74,256. Of this, the railways are definitely charged with only 11.2 per cent, while 24.2 per cent of the damage is due to known causes other than railways, and 64.6 per cent to unknown causes. Thus the railways, exclusive of government lines and a few railways having provincial charters, are directly charged with less than half of the total number of fires reported as having originated within 300 feet of the track; these burned over less than one-third of the total area reported, and did only one-tenth of the total estimated damage. This showing is distinctly favourable to the railways, especially when it is considered that this 10 per cent of damage totals less than $8,400. These figures show that the railways have been remarkably efficient in extinguishing their own fires, as well as those due to outside causes.

Of all fires reported, the causes are as follows: Locomotives, 33.9 per cent; railway employees, 9.5 per cent; tramps, etc., 11.4 per cent; settlers, 12.5 per cent; other known causes, 3.9 per cent; unknown causes, 28.8 per cent. It will thus be seen that the carelessness of tramps and settlers constitutes a very serious source of fire danger along railways, these two elements combined accounting for nearly one-fourth of the total number of fires reported.—C. L. in Conservation.

Quebec Limit Holders Extend Planting Idea

The activities at the Berthierville Forest Nursery of the Quebec Government, under the direct charge of Mr. G. C. Piche, continue to show interesting developments.

The Nursery has shipped this season over 380,000 plants of which about 9 per cent were hardwoods and the balance conifers. Three hundred and forty-five thousand plants were sold for reforestation purposes and the remainder for ornamental uses. The demand has been multiplying year after year so that it may be assumed the Quebec Forest Nursery is only at the beginning of its usefulness.

The Laurentide Company at Grand Mere have bought 240,000 plants, the Riordan Company have also started experiments, and the Bronson Company are taking similar measures. It is anticipated that next year several others of the limit holders will come into line with the planting movement and that several thousand acres will be yearly reclaimed.

The experience of the Quebec Forest Department is that the private owners are rapidly awakening to the possibilities of reforestation and their demands for information, seeds and plants are also increasing. Mention may be made of the Estate of the Seigniory of Perthius that has purchased 50,000 trees yearly from Berthierville since 1912. Two Montreal barristers, Messrs. Fleet and Lafleur have commenced the reforesting of their summer properties. Numbers of plants have been distributed to the colleges, convents, and other institutions to promote the establishments of small woodlots nearby.

One of the staff of the Forest School of Laval, Mr. Maheu, delivered forestry lectures in 14 colleges, met over 3,500 students, and 375 instructors. This branch of lecture work will be followed more extensively next year.

The summer's work of Mr. Piche's department was concerned also with the classification of lands, which was started in 1909, and it will require at least five years more to complete the task.

The Forestry School, under direction of Mr. Avila Bedard and Mr. Piche will spend the summer months on the limits of the River Ouelle Pulp and Lumber Company, making inventories of stands, marking trees in view of trying several systems of lumbering on forestry principles.

At the graduating exercises on June 18th, the following received their diplomas: Wm. Guay, Methot, Guillemette and Dufresne. Mr. Guay left for Manitoba in charge of a reconnaissance party for the Federal Government; Mr. Guillemette is attached to the Forest Service of the Province; Mr. Methot is spending the summer with the St. Maurice Forest Protective Association, and Mr. Dufresne has gone also to help in forest protection work at Mattagami, Ont.

It is anticipated that a good number of students will enter in September.

A View from Thessalon

Thessalon, Ont., "Advocate": In the Province of Quebec no one is allowed to set out fire for this purpose unless he has a permit from a fire warden. This is one of the many regulations that the Legislature of Ontario should lose no time in adopting. We trust it will not be forgotten.

How Plantations Are Thinned

Preserving the Wind Belt. When to Commence Thinning. Removing the Diseased and Dying Trees.

By H. M. Morrison,
Porcupine Forest Reserve, Usherville, Sask.

If one is to be successful in rearing timber for profit, there is, perhaps, no branch more important than a thorough knowledge of the art of thinning and yet this is a subject on which there is considerable diversity of opinion. What is the object of thinning, one may ask? Well, in the first place, it is to utilize that material in the plantation which otherwise would be rendered useless by rivalry of the other trees. Twenty to thirty per cent of the yield of a plantation should be given by thinnings. Thinning also stimulates growth and helps the development of the remaining trees and influences the deeper production and time of maturity of the plantation as a whole. It improves the soil as well as the remaining trees. It also prevents the formation of knots and useless branch wood. The life of the plantation may be lengthened or shortened by the mode of the thinning; when properly done and at the correct time it should render the remaining trees more proof against wind, storms, snow, insects and fungi. Final thinning is generally carried out with a view to promoting natural regeneration. In mixed woods thinning regulates the proportion of the trees in mixture.

No unchanging rules can be laid down for the thinning of plantations,it is to a great extent a matter of experience and good judgment, but the following general principles may be of use to those who undertake this work:

1. Study the relationship of trees and soil and act accordingly.
2. Begin to thin at the correct time and most sheltered spot.
3. Cut away all diseased and dying trees.

In thinning young or old plantations the work must always be subject to modification, according to the nature of the trees and soil and the ultimate use of the plantation which is being operated upon, and much forethought and discrimination are required.

When to Commence.

One of the most important things in thinning plantations is to know when to commence the operation. If it be delayed too long, the result is stems whose length is out of all proportion to their diameter. Such trees have not sufficient stem development in girth to withstand wind, storms, or snow whose weight they cannot bear. As a general rule thinning should commence when the plantation is from 20 to 25 years old and should be repeated at from intervals of from 5 to 10 years. When trees have finished height growth and have developed clean and branchless stems, thinning gives them more soil-room and light and thus increases nutrition. It also produces broader year rings and wood of better quality. Without it the wood is apt to be soft and springy.

The wind belt of a plantation which is usually from 20 to 30 yards deep should not be thinned as it protects the inner trees which may then be more severely thinned. Gaps in the plantation must be avoided. When the trees are much crowded, the thinning must not be too severe at one time. In thinning a wood which has been too long neglected, the outer margin should not be too severely thinned; and trees isolated by thinning are apt to be thrown by wind. In mixed woods with several species the more valuable trees require more protection than the rest.

Autumn and early Winter are the periods usually chosen for thinning plantations. But it should be remembered that at the latter time the lowest percentage of moisture (47 per cent according to Webster) is present and the timber therefore is then most valuable for construction purposes. Larch is ready for thinning at from 12 to 15 years, Scots Pine at about 25, Oak at 20 to 25, Beech at 25 to 30, Spruce and Silver at 30 to 35 years. Trees which naturally open out such as the Pine do not respond as surely to thinning as Beech and Silver, for if the Pine does not get sufficient light and space in time, it is suppressed for good. Therefore special care must be taken to thin Pine plantations and those similar at the time when they will respond. It is well to commence thinning the plantation at the centre or most sheltered spot, so that the outer intact boundary continues to form a shield against wind which might prove harmful to the trees which had previously stood in close formation.

Classes of Trees.

In a plantation we find the following classes of trees:

1. Predominating trees which have outgrown the others:
   - (a) Trees whose stems and general formation are good.
   - (b) Trees whose stems are bent and gnarled and altogether badly developed.
2. Dominating.
3. Dominated stems.
4. Suppressed.
5. Diseased and cankered.

In thinning it is well to retain as many of class 1 as possible in equal distribution all over, more particularly those of sub-division (a). If trees of class 2 interfere with the stems of class 1 (a) they should be removed, but care must be taken that this removal does not break the canopy which would result in windfall. Trees belonging to class 1 (b) should, if possible, be replaced by those of class 2 and this should be done early in the thinning process. In classes 3 and 4 pretty severe thinning among light demanders should be done. Shade bearers stand more crowding than light demanders—they can do with 30 to 50 per cent less space, therefore thinning need not be nearly so severe among them. Trees of classes 2 and 3, dominating and dominated, are those which require most light. As a rule dominated trees should only be removed when they are poor struggling specimens or of a species not wanted in the particular plantation being thinned.

I have in this paper only touched the fringe, as it were, of the interesting study of thinning and have not attempted to discuss the various methods practised in the forests of Germany, France and America. My aim has been to assist, if possible, practical beginners in this particular branch of the absorbing and fascinating subject of forestry.

The Monarch oak, the Patriarch of the trees.
Shoots, rises up, and spreads by slow degrees;
Three centuries he grows, and three he stays,
Supreme in state, and in three more decays.—Dryden.

(Courtesy of Grand Trunk Railway System.)
ONE OF THE ENTICING TRIBUTARIES TO LAKE TEMAGAMI.

Telephone's Use in British Columbia Fires

The telephone companies in British Columbia are co-operating with the Forest Branch in reporting of forest fires throughout the province. Operators are instructed to give precedence to reports of fires, and to give special messenger service to messages. Country subscribers are glad to report any fires, thus becoming voluntary patrolmen or observers. With the further extension of country lines better reporting service will be obtained, and that without cost to the government beyond toll charges.

There are, however, many heavily timbered districts into which commercial telephone companies will be unable to build for many years, and which must be provided with telephone service if the timber is to receive any kind of protection from fires. Into these districts, and to look-out stations, telephone lines must be built by the provincial government, and a number of such lines have already been constructed.

These lines all connect with commercial or Dominion government lines, and are open to use by the public. Instruments are installed in settlers' homes, stopping places, logging camps, or any other suitable location, besides forest officers' headquarters, wherever this can be done without overloading the line.

No. 9, B. W. G. galvanized iron wire is used exclusively, and strung on trees wherever possible, cheapness in construction being necessary. No. 37 Thomas split tree insulators are used on tree lines with a No. 32

Brookfield double petticoat pony insulator on 2-inch by 2¼-inch oak bracket at every fifth to seventh tie. No. 12 B. W. B. iron wire and No. 18 siezing strand is used for the ties. In stringing a tree line a maximum amount of sag is allowed to permit the wire to be borne to the ground by falling trees, instead of breaking. The wire must, however, clear a man on horseback.

Telephone wall sets are used where the instruments are in houses, while an iron set, is used where no protection is available. Patrolmen and repair men carry a portable set, No. 1375-A developed for the United States Forest Service.

Three hundred and sixty miles were erected during 1913 at an average cost of sixty dollars per mile; ninety miles in 1914 at one hundred and twenty-five dollars per mile, and 36.2 miles in 1915 at a cost of $26.50 per mile. The higher cost per unit in 1914 is due to the great expense of transporting material for the upper end of the line from Revelstoke to Big Bend, one hundred and twenty-five miles, which had to be done on pack horses, and the expense entailed in purchasing and laying four miles of submarine cable in the Heriot Bay line. This cable is single conductor seven strand No. 19 B. & S. copper tinned, 3/32 inch wall special submarine rubber tape serving of jute, with No. 10 B. W. G. galvanized steel armour. The cable was required for crossing Okisholow, Nodales and Cardero channels and Loughborough Inlet, the distances varying from twenty-eight feet to six thousand feet. The shallowest channel was four hundred feet deep and the deepest about one thousand feet. The cable was laid from a reel on a scow, towed by one of the government launches.

The following list of lines, constructed by the forest branch, is constantly being added to:

Hazelton-Suskwa River, twenty miles; Terrace-Lakslse Lake, seventeen miles; Heriot Bay-Loughborough Inlet sixty-four miles; Princeton-Five Mile Creek, twenty miles; Kelowna-White Mt. Lookout Station, twelve miles; Vernon-BX Mt. Lookout Station, eighteen miles; Grand Forks-North Fork Kettle River, forty-four miles; Erie-Second Relief Mine, fourteen miles; Arrow Park-Mosquito Creek, seven miles; Lardo-Duncan River, forty miles; Revelstoke-Big Bend, one hundred and twenty miles; Creston-Goat Mt. Lookout Station, three miles; Cranbrook-Baker Mt. Lookout Station, seven miles; Canal Flats-Upper Kootenay River, twenty miles, and Natal-Upper Elk River, forty-five miles.

Prof. S. B. Green on "Causes of Fires"

The following was written by Prof. S. B. Green in "Forestry in Minnesota" and has an interesting relation to the conditions giving rise to Canadian forest fires:

"Spring fires are very injurious to trees and especially tender seedlings for trees in the spring of the year are full of sap and can endure but little heat.

Summer and Autumn fires generally run deep into the ground and if the soil is very dry and of a peaty nature burn off the roots of the trees. The result of this is that the trees are blown down in great confusion and form what are known as "fire falls." Where a thick growth falls, it forms an almost impassable barrier which remains in this state until decay and repeated fires extending over a long series of years finally destroy the trees and perhaps get the land into condition for a new growth.

Causes of Forest Fires.—The only natural causes of forest fires are friction and lightning, both of which occasionally start fires in dead trees, but as such fires are most likely to be set during a rain they seldom do much damage. Practically all the injurious forest fires that have devastated the forested part of this section have resulted indirectly either from a lack of appreciation of the damage done by them or from carelessness and ignorance. **In the disastrous Hinckley fire of 1894 the damage was done by a large fire formed by the combination of several small fires that were allowed to smoulder in the swamps near** Hinckley for a week or more, which **when fanned by a dry hot wind attained an irresistible energy. If we had had a fire law that could have been properly enforced at that time, or if the people near Hinckley had been aware of their danger, that great fire, with its attendant great loss of life and property, need not have occurred.**

Fires often escape from settlers when they are clearing land and are sometimes started by them to make pasture for their stock. The careless use of fire by the hunters, prospectors and others who camp in the forest and leave their camp fires unextinguished is another common cause of fires. Railroads set many fires and should be required to more rigidly conform to the law requiring them to use spark arresters and to keep their right-of-way free from combustible material.

The moral effect of a properly enforced forest fire law is not only very great in restraining the careless, but especially in educating law-abiding citizens in the idea that there is value in young seedlings and timber trees.

The prevention of forest fires will be most certainly accomplished by educating our people to an appreciation of the amount of damage done by them.. **In some counties in this state it is impossible to enforce the law against setting forest fires owing to the belief that fires are a good thing for their sections in destroying tree growth and bringing the land into condition to be easily taken up by settlers.** There is some truth in this claim, but since the fires destroy all increase on the land they sweep over, a large amount of it is thereby rendered entirely unproductive long before the settlers are ready for it, while in the meantime it might be producing a crop of valuable timber. Then again, it is the greatest injustice to allow one person to burn the property of another, which right is practically claimed by those who advocate the unrestricted use of fire."

Huge Timbers for New Fleet

Responding to invitations extended by the officials of the British Columbia Mills, Timber and Trading Company, Limited, many Vancouver citizens paid a visit recently to Hastings Mills—a landmark on Burrard Inlet for over half a century —to inspect some unusually large timbers which had been cut to order. Three of the huge sticks of Douglas fir measured from 110 to 116 feet in length and 20x20 inches in girth, and were manufactured to the order of the Wallace Shipyards, Limited, North Vancouver, to form the keels of the first of the fleet of wooden schooners to be constructed under the new Shipping Act of the British Columbia Government. Another massive timber, 100 feet in length and 28 inches in diameter, was being fashioned by ship carpenters into a mainmast for the brigantine Amy Turner, of Vancouver, and was pronounced one of the finest sticks ever brought into Van-

couver, being without blemish from stem to tip when shaped and polished. The sticks supplied for the other spars, while not so large, were equally free from defects. Other large timbers of varying lengths and diameters were being assembled for shipment by rail, and the collection formed an impressive exhibit of British Columbia forest possibilities and mill equipment. The big timbers came from the limits of the British Columbia Mills, Timber and Trading Company, Limited, at Rock Bay. It is not generally known that at one time the company furnished the majority of the mast and spar timber for use in the British navy, and so large are its reserves that no difficulty would be experienced today in duplicating the business.

Tree Planting to Overcome Sand and Snow

The railways of Canada are taking an increasing interest in the planting of trees and shrubs to secure better control of drifting snow and drifting sand, both of which interfere seriously with the operation of trains.

East of Montreal near Vaucluse, in Quebec, light drifting sand has given trouble to the Canadian Pacific railway since the very thin sod was plowed up, writes B. M. W. in "Conservation." Hot boxes resulted to rolling stock and passengers suffered from dust. The ordinary right-of-way fence was covered by the sand, and cattle could stray out on the track. Snow fences were used to some advantage, but in a bad season these would be almost covered up.

In 1915 a number of grasses, including Brome, were planted but perished from the heat, which is excessive on these exposed sand beds. This spring, 3,500 cuttings of cottonwood (*Populus deltoides*) and 1,000 one-year transplanted jack pines were planted. An examination made after the trees and cuttings were in the ground a month showed that approximately 95 per cent were making good progress.

Cottonwood Used.

The cottonwood was placed in rows two and one-half feet apart, the distance between the rows being four feet. The jack pine was planted in rows six feet apart, distance between the rows five feet. The distance from the last row to the centre of the track is about 150 feet. All the planting parallels the track.

It is hoped that the vigorous growth of the cottonwood will protect the jack pine until such time as the latter can take care of itself. If the results prove satisfactory, other situations along the company's line will be planted in the near future. The unusual amount of rain which has occurred this spring and early summer has contributed very materially to the prospects of success.

For a permanent snow fence which would grow rapidly and have sufficient foliage, 6,000 Norway spruce and 15,000 caragana were planted. The former were five-year transplants, of from 20 to24 inches height, of heavy sturdy crown and well-developed root system. The caragana were from 30 to 48 inches in height and about three years of age. The caragana, as well as 1,500 lilacs used in mixture for snow breaks, are from the nursery of the company at Wolseley, Sask.

Planting Methods.

The following methods of planting were carried out: Where the distance from the track to the right-of-way fence is over 50 feet, a "standard" break was put in, viz., one row of spruce was planted 8 feet apart, and in front of this, caragana were placed two and one-half feet

apart. The distance between the rows is six feet. If there was only fifty feet between the track and the fence one row of Norway Spruce was planted six feet apart or two rows of caragana forty-six feet apart. On several situations one row of caragana was planted.

The open-grown Norway spruce is the best tree that can be used for snow breaks in Eastern Canada. It is of rapid growth, is comparatively free from enemies, and branches close to the ground. It will require protection from fire. It is expected that the Norway spruce will be effective as a snow break alone in five years.

Caragana arborescens, the Siberian pea tree, when well trimmed, at its present height ought to provide a good mesh for snow break the second year after planting. Caragana is hardy, free from insect activities, not attacked by cattle, of quick growth and beautiful foliage. It sprouts well.

At some of the company's stations, spruce, caragana and lilac were used for wind break and for improving the grounds.

Praise for H. R. MacMillan's Good Work

Referring to the work of the Forest Branch of British Columbia, the Forestry Quarterly pays tribute as follows:

"To cap the climax of this remarkable activity of the Forest Branch in securing markets, the Chief Forester, Mr. H. R. MacMillan, who is responsible for developing this phase of the Forest Branch, was appointed Special Trade Commissioner of the Dominion Department of Trade and Commerce, and has been traveling for nearly a year to all parts of the world, with a view to establishing trade connection for British Columbia mill products and furnishing insight through personal knowledge into special requirements of markets.

"Of course, all this literature, which is distributed freely by the hundred thousands, is frankly propagandist and advertising matter, but, considering the source, must be truthful and authoritative, devoid of extravagant claims which a private concern might make.

"From the forester's point of view at first sight, this canvassing would appear out of his field, but as a matter of fact, application of forestry methods can only be afforded when the cost of the dead work—dead for the present—always involved in any forestry work—work for the future—is covered by the price obtainable for the present product. To find profitable markets and extension of use of minor materials particularly seems to us a most needful undertaking, especially in British Columbia, where for years the lumber industry has been suffering by its distance from markets.

"There is one result which will come to the Forest Branch from this well-directed propaganda which must not be underrated, namely, that it will ingratiate itself with the lumber industry and through that with the politicians, so that it will be possible more readily to inaugurate conservative processes of forestry practices. We congratulate Mr. MacMillan on his enterprise in going out beyond mere routine administrative work."

Timber Resources of the Queen Charlotte Islands

Splendid Growth of Spruce, Hemlock and Cedar. Virgin Stands of Huge Girth Timbers

By Roland D. Craig,
Commission of Conservation, Vancouver.

The Queen Charlotte Islands were so named by the explorer, Capt. Portlock Dixon, who in 1789 visited these islands in his ship "Queen Charlotte," but little was known of them from the geographical standpoint until explored and mapped by Geo. M. Dawson, of the Geological Survey, in 1878. Even yet the people of Canada do not appreciate the extent and the resources of these islands.

Physiographically they form a part of the partially submerged range of mountains including the Olympics, Vancouver Island, Prince of Wales Island, and the other mountainous coastal islands of Alaska. Being separated from the mainland by a stretch of water from 50 to 100 miles wide, known as Hecate Passage, these islands were unvisited except by a few traders and scientists until the advent of the Grand Trunk Pacific Railway turned the attention of investors to these northern lands.

The group of islands extends in a north and south line about 150 miles, Graham Island and Moresby Islands being the most important ones, with several others of considerable size, such as Burnaby, Lyell and Louise, lying along the eastern side of Moresby Island. Graham Island, the most northerly, is 53 miles wide at the north end, 25 miles on the south end, and about 50 miles from north to south, covering approximately 2,000 square miles. Moresby Island is about 30 miles wide on the north end, and with the adjoining islands gradually tapers to a point 100 miles south, with an area approximately 1,200 square miles.

A range of mountains extends along the western side of Graham Island and down through Moresby Island to the southern extremity, leaving about three-quarters of Graham Island on the east side practically flat country. Moresby and the adjoining islands are nearly all mountainous and rough in contour.

Graham Island is indented on the north side by two large harbors, Masset Inlet and Naden Harbor. The former, after traversing a narrow channel for 17 miles, opens out into an irregularly shaped expanse of water about 18 miles from east to west and six miles from north to south. Naden Harbor, with its approach, Virago Sound, extends about 14 miles back, and after a narrow entrance widens to a fine protected harbor six miles long by four miles wide. Skidegate Inlet, which divides Graham Island from Moresby Island, forms an excellent harbor on the south, and all along the east side of Moresby Island the Coast is indented with bays and passages which are navigable for large ships. The west coast has few harbors, Rennell Sound, on Graham Island, being the only one affording adequate shelter for shipping. As a consequence, it is uninhabited, and with the exception of some oil prospectors has been little visited.

Climate Agreeable.

The claimate of these islands is mild and equable owing to the influence of the Japan Current, and though there is considerable cloudy weather the precipitation in both snow and rain is only about half what it is on the adjacent mainland, being only slightly more than that of Vancouver.

The Queen Charlotte Islands are rich in natural resources, chief among which are fish, timber, agricultural land, coal, oil, copper, silver, gold and other minerals. Agriculture will be confined largely to the flat lands on Graham Island, of which, it is estimated, there are 400,000 acres which can be brought under cultivation. This land lies at from 200 to 500 feet above sea level and for the most part is of a muskeg type, the mineral soil being overlaid with moss and decaying vegetable matter for a depth of from three inches to two feet, probably not averaging over eight inches. There is a scattering of scrubby timber on these lands which entails some clearing, but the chief necessity for cultivation is drainage. Settlements have been started at several points on Masset Inlet and Skidegate Inlet, and these have demonstrated that the soil and climate is conducive to the successful growing of all kinds of garden produce, small fruits and live stock. The farm produce from these islands has twice secured the first prize for district exhibits at the Prince Rupert agricultural show.

Spruce of Large Sizes.

The timber on Graham Island is composed of hemlock, spruce, red cedar, yellow cedar and jack pine. On flat lands the merchantable stands are confined to the shore lines and watercourses where drainage is afforded. The spruce grows to immense sizes, often eight feet in diameter and 250 to 300 feet high, but that growing along the shore is inclined to be limby and in places conky, so that it does not cut out a high percentage of clear timber. Farther back from the water, where it is less exposed, it is of a better quality. The hemlock is, as a rule, superior in quality to that found in the southern part of the province and will be perhaps the most important forest species. The red cedar, though it grows to large sizes, is not, as a rule, very sound, and will be more suitable for the manufacture of shingles than lumber. The yellow cedar, which grows in the more swampy or the higher sites in places reaches merchantable size, but on the flat lands it is generally scrubby and tapers very rapidly from the butt. The jack pine will be useful for mining props, fuel, etc., but cannot be considered as saw material. These observations refer to the timber on Graham Island generally, though along the rivers and shore line of the inlets and lakes there are excellent stands of timber which will run from 25 M. to 100 M. per acre over considerable areas. This heavy stand does not, however, extend back far from the drainage lines.

On Moresby and the adjacent islands the more mountainous nature of the land permits of better drainage and there is very little muskeg, the hillsides being covered with a good stand of timber of the same species as above. The quality of the timber is generally better than that found on the wetter lands of Graham Island.

The timber on these islands, of which there is estimated to be from twelve to fifteen billion feet, has not been exploited to any extent as yet, though there are three small sawmills on Masset Inlet and two on Skidegate Inlet, but their operations have been very limited. The present demand for spruce has resulted in some activity in this region, but the cut is not large.

Future for Pulp Mills.

This timber is especially suitable for the manufacture of pulp and un-
8226—Forestry journal 8-9-16 6
doubtedly in the near future this will become an important industry in the Queen Charlottes in combination with the lumber and shingle mills. The lack of adequate transportation facilities is the chief deterrent of the development of the islands at present.

Coal has been prospected and developed to a certain extent on Graham Island for many years, and the prospecting for oil on the west coast of the island is being energetically pursued with encouraging indications of success.

Of the other minerals the chief development has been at the Ikeda mine, near the southern end of Woresby Island, which has been turning out valuable copper ore for several years. There are a number of other good prospects in this vicinity. Though rich float containing gold has been found on Graham Island, the source has not yet been discovered.

The waters around Queen Charlotte Islands provide perhaps the best halibut fishing on the coast, and salmon, cod and other valuable fish are abundant.

This is a part of British Columbia the resources of which have as yet not been realized, but which will become a source of great wealth when they are developed. Situated within eighty miles of Prince Rupert, and directly on the route which will be followed by the shipping which is bound to develop between that port and the Orient, the transportation question will soon be solved, and then this outpost of the province will become an important industrial region.

The Fake Settler

(By James Lawler.)

A tale there is, and it must be told,
Though it shame our native land,
Of injury done to Canada's weal
By the fakir settler band.

The settler true is a man to praise,
We shout to his tribe, "All hail!"
But the pseudo-settler's fitting place
Is a cell in a county jail.

The settler true goes into the bush
And hews himself a farm,
And cities and seaports and industries grow
'Neath the guard of his strong right arm.

But the fakir settler goes to the woods,
The spruce and pine to steal;
He cares nought for the lumberman,
Nought for the public weal.

His aim is only to get the logs—
He pays no tax nor due—
And when he has skinned the timber off
He hikes to pastures new.

Parliament members he worries with lies,
He knows not a plow from a spade,
He never yet grew a bushel of wheat,
Perjury's part of his trade.

The fakir-settler's vilest trick
Is one he plays with a torch;
If the nearest lumberman will not "cut"
He gives the timber a scorch.

To scorch the trees that they must be cut
Is the fakir-settler's aim,
But often it ends in a holocaust,
With the township wrapped in flame.

Then its "Hip-hurrah" for the settler true,
Whose name is with honor linked,
But its prod and slam the settler sham
Till his tribe is clear extinct.

"Ten Pounds Fine"--A Hint From the Fire Laws of 1832

"For Protection of Lives and Property. Severe Pains and Penalties Should Be Inflicted"--Gov. Simpson's Council

The following notes of regulations in regard to fire established by the Council of Assiniboia which administered affairs in the Red River Settlement, are from Volume 1 of the Canadian Archives Report, 1914, "The Canadian Northwest—Its Early Development and Legislative Records."

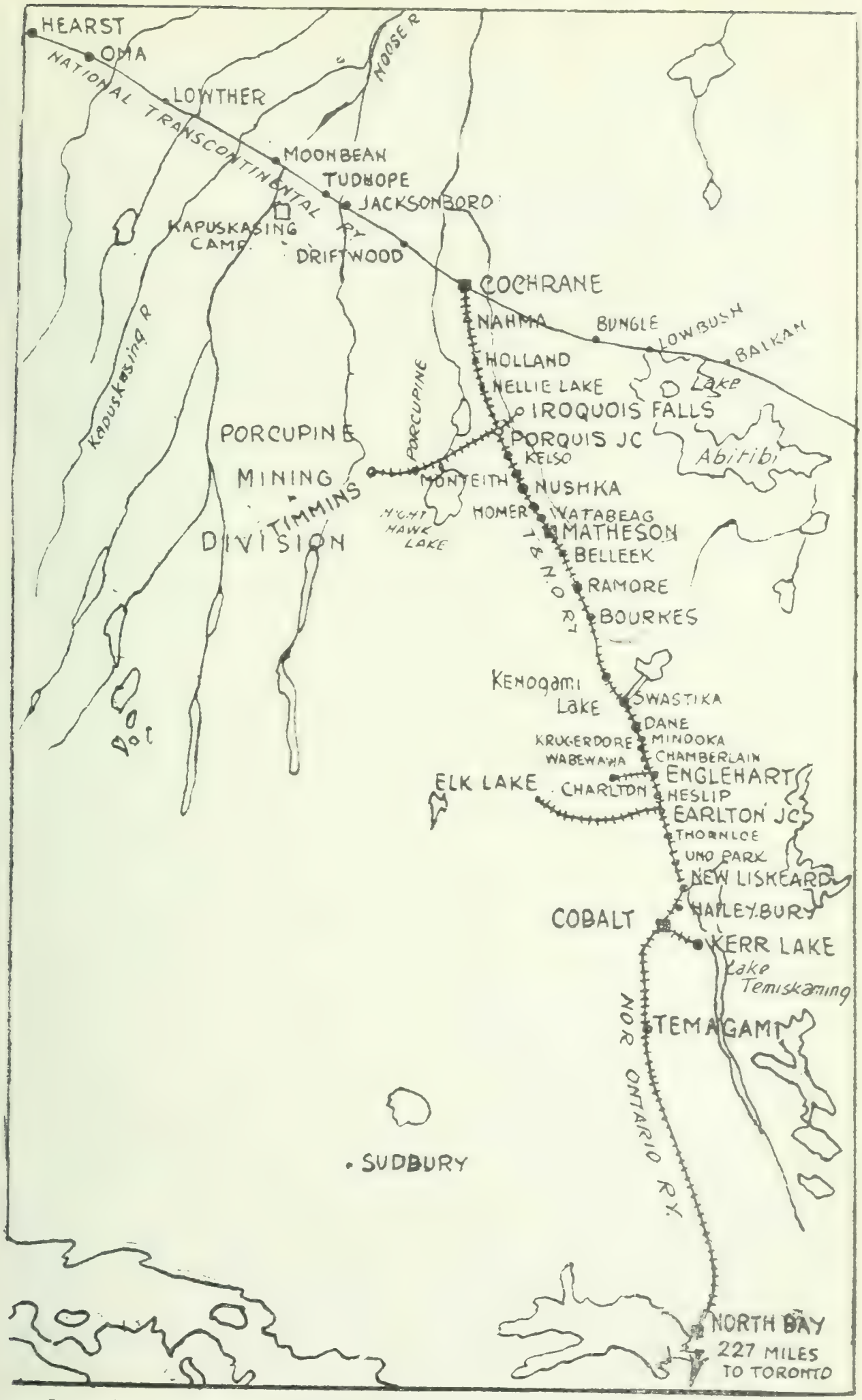
Proceedings of a Council held at Fort Garry on Friday the 4th day of May, 1832.

Present: George Simpson, Esq., Governor of Rupert's Land, President; Donald McKenzie, Esq., Governor of Assiniboia; James Sutherland, Esq., Councillor; James Pritchard, Esq., Councillor; Robert Logan, Esq., Councillor.

The great injury done to the woods of the settlement by fire and the serious danger and loss occasioned annually by that devouring element, arising from the wilfulness of some ill-disposed persons, and the negligence of others, render it absolutely necessary, for the protection of lives and property, that salutary regulations should be formed with a view to check this evil, and that severe pains and penalties should be inflicted on all persons who may violate such regulations. It is, therefore,

Resolved, 1st. That in all cases where it can be proved that the proprietor or occupant of land lights a fire, between the 1st of March and the 1st of December, for any purpose whatsoever, at a distance exceeding fifty yards from his house even upon his own lands, he be fined in the sum of ten pounds, which will be levied forthwith by the sale of the party's effects if necessary, one half of which fine shall be paid over to the informant and the other half retained in the hands of the Council, as a fund to meet such objects as they may hereafter be desirous of carrying into effect connected with the welfare and prosperity of the settlement.

Resolved 2nd. That, in all cases where it can be proved that any person lights a fire between the 1st of March and the 1st of December, either in the woods or plains beyond the boundary of his own property or farm, either ten miles of the banks of the river on either side whether it be productive of any injury or not, he be fined in the sum of ten pounds, to be levied as stated in the foregoing resolution and to be disposed of in like manner, except in cases where such fires may have been lighted through absolute necessity, of which the Council alone (shall) be competent Judges and, if the party so transgressing be destitute of means to pay the fine, he be banished from the settlement and subjected to hard labour, and the produce thereof be applied to the liquidation of the fine.



Scene of the Northern Ontario fires of July 28 and 29. About 1,200 square miles devastated between Ramore and Cochrane, with a loss of about 250 lives, and whole or partial destruction of Cochrane, Porquois Junction, Iroquois Falls, Kelso, Matheson, Nushka, and Ramore.

The Commonsense of Silviculture

An Address by Raphael Zon, U.S. Forest Service, at the Closing Exercises of Yale Forest School

In a few months from now most of you will be knocking at the door of Opportunity and offering your services as professional foresters to the Federal Government, or to the States or to private lumber companies. Although you will emerge from the forest school in th efull armament of all-around knowledge, some cynics will tell you that much of this armament will soon be lost from mere disuse, while more of it you will throw overboard yourselves as unnecessary ballast that merely hampers your progress.

What part then of the mental baggage which you wil ltake from school will prove the least useful to you in life? Will it be forest valuation with its complicated formulas of soil and forest rent, or forest management with its ideal "normal forest," or lumbering, or silviculture or what? Will life demand service from you as loggers, or silviculturists, administrators, or forest managers? Judging by the pessimistic tone of a number of leading men in the lumber industry, and in forestry, who in late years have expressed their views on the subject, it would seem that the sooner the graduates from forest schools forget all their technical forest knowledge and learn the mechanical details of logging, wood utilization, and administration, the greater will be their chances for finding jobs.

Is the Country Ready?

This country, we are told, is not yet ready for the practice of silviculture: we have too many purely administrative problems yet to settle; we have fire protection methods to work out and boundaries to determine; we have logging problems to solve and problems in timber sale procedure; we must wait for stumpage prices to rise more nearly to the level of the European prices and the country must become more settled before the practice of silviculture can begin; our virgin mature timber must first be cut and our silvicultural practice should begin with the second growth; there is no particular need, therefore, for the application of silviculture; common horse sense, ability to get along with people, a ready knowledge of lumber and logging problems are all that is needed to equip a man for a successful career as a forester.

The acceptance of such a view would virtually amount to the admission that much of forestry training is needless, that of all schools of applied science the forest schools are the only ones which do not fully prepare men for the actual work which they are called upon to do.

Is there any justification for such an admission, and is there not some misunderstanding of what silviculture really means? Those who still speak of silviculture as something for which this country is not yet ready, think of European silviculture, or refined and intensive methods of planting, of the minute care in handling each forest stand, as contrasted with the rough and ready methods of cutting practiced in the United States today. While we have been told on many occasions that the science of silviculture knows no countries and is applicable wherever forests grow, yet, as a matter of fact, what we have been actually taught have been methods of silvicultural procedure as developed and adapted to the economic

(Courtesy of "Forest Leaves" and Prof. J. S. Illick, of Philadelphia.)

STAND OF SCOTCH PINE PLANTED 32 YEARS AGO SOUTH OF RHEIMS, FRANCE.

conditions of Germany and other parts of Europe of many decades ago. The first American foresters who went to Europe to ascertain the methods of silviculture found, much to their dismay, that there are only a few places in this country where clear-cutting and planting are possible; that the shelterwood compartment method requires permanent roads and a constant market for all products; that most of the clear-cut systems with natural reproduction as practiced in Europe are impossible here, because we may not be able to clear-cut the forest at all; that there are but few places where the coppice method can be carried out as in Europe; and that the selection system, which seems best suited to our conditions, is regarded in Europe as a very poor method except in the mountains where the forest cover must be kept intact. The wise ones and those of a practical turn of mind soon realized the impracticability of this kind of silviculture and condemned its practice in this country altogether, or at least for the present; and those who persisted in applying the German silvicultural methods to the forests and economic conditions of this country deservedly earned the name of impractical and brought silviculture very much into disrepute. It was very unfortunate for us that at the beginning of our work in this country we accepted the silvicultural systems as developed in Europe as the only possible scientific silviculture, when, as a matter of fact, they were only empirical rules developed with special reference to given species and economic conditions. We were not taught the fundamental facts about

our forests—the real science that underlies the practice of silviculture in this country, the life histories of our species, the development of our forest stands.

What Is Silviculture?

Silviculture is the application of the knowledge of the requirements of different kinds of trees to the perpetuation of the existing forests, or to raising new ones and working them to the best advantage of the forest owner. In other words, the relation of silviculture to the utilization of the forest should be the same as the application of any science to an industry.

The practice of silviculture is predicated only on one condition; namely, that the land is to be maintained in forest, just as successful agriculture is based on the condition that the land is to be used for the growing of field crops. And just as agriculture existed long before agricultural colleges were established, so some rough silviculture was practiced in this country before the forest schools were born. Silviculture, as a matter of fact, is now being evolved in this country although silviculturists may not even be aware of it. Silviculture certainly can not be evolved from books only, or in the class room; it needs close observation, original and careful studies, and actual experience on the ground. In the early days of logging in Maine and throughout the Northeast, as well as in the South, when only the largest trees were cut and logs 16 and 18 inches in the top were taken out, a selection system of cutting was going on which resulted in most cases in splendid natural reproduction both of spruce in the North and yellow pine in the South. This method of logging was in a sense silviculture, although unconsciously practiced by the lumbermen; it was a silvicultural method which foresters, had they been active then, could have advocated for the perpetuation of the forest, and one fully in accord with the economic requirements of that time. If we free ourselves from the mental shackles imposed upon us by the manuals on silviculture, that the practice of silviculture consists only of using the several European silvicultural systems, and take a broader view of silviculture as any method possible and justifiable under economic conditions which may bring about the perpetuation of the forest, then silviculture can be practiced and is being practiced today in this country. It does not need to wait until the stumpage prices increase to the level of those in Europe, or until the population becomes dense, or until all of our administrative problems are settled. Silviculture is being practiced, on land which is maintained for forest purposes, the moment cuttings begin. On such land silviculture, as a matter of fact, is inseparable from logging. It is largely through the axe that silvicultural plans are realized. The first cuttings on the National Forests involved some practice of silviculture whether we knew it or not. Possibly it was bad silviculture, but it could just as well have been good silviculture if we had known more about it. If we do not practice good silviculture it is not because the time is not ripe for it, or because the need for such silviculture does not exist, but it is because our knowledge is still inadequate and we do not yet know enough of the life history of our species and of our forests to be able to devise the most efficient and practicable methods. If you hear, therefore, an administrative officer say that he can not afford to practice silviculture because of economic limitations, because of the cost of logging, because of other more pressing problems on his hands, you may be certain that he is thinking of some German silvicultural system and does not sufficiently analyze the actual situation. The truth of the matter is that he can better afford to postpone the regula-

tion of cuttings or the preparation of a working plan or even the perfecting of his plans for fire protection, but he can not afford to delay the practice of some form of silviculture when he begins cutting and making some provision, as he must, for the perpetuation of the forest. Given definite economic conditions, the necessity of providing for the perpetuation of the forest, and adequate basic knowledge of our forests, some system of silviculture is bound to be devised which will be both efficient and practical. And the more fundamental knowledge there is regarding our forests, the simpler and more practical will be the silvicultural systems devised.

Practice Silviculture Now.

If we are to wait for the time when the shelterwood compartment method, or selection cuttings in groups, or some other approved German silvicultural system can be applied to our forests we may not have any opportunity to practice silviculture at all, because, aside from economic considerations, those systems may not fit the biological requirements of our species, climate, or logging methods. If we look, however, upon silviculture as logging modified even to a slight extent by the forester for the sake of keeping the woods going forever, the opportunity for the practice of silviculture is now at hand almost everywhere.

The tie-cutter in Pennsylvania or South Carolina, who has learned from observing the growth of chestnut and loblolly pine that if he cuts those trees only that make three ties he can come to the same place every five years and cut the same number of ties, is practicing silviculture. When the pulp mill men cut only the mature spruce and fir and leave trees below a certain size in the woods for future cutting and stocking of the ground, they are practicing silviculture. When the cutter of firewood in New England has learned that by cutting his woodlot at the rate of one cord of wood a year per acre he can continue to use his woodlot forever without diminishing the supply, he is practicing silviculture. When a forest owner cuts clear his mature timber and leaves the young growth and protects it from fire, he is practicing silviculture.

In the early cuttings on the National Forests in western Idaho, in the western white pine and larch stands, the tendency was to sell both pine and larch, for fear that if the larch were left uncut it would seed the ground and thus eliminate the more valuable white pine from the future stand. The lumbermen, however, strongly objected to taking larch, since it had no market and, because of its weight, it was costly to log. The result was that while nominally the government charged the lumbermen for larch, its price was actually deducted from the price of the white pine. A study of the natural development of the western pine-larch forest revealed the fact that after a burn or any other clearing the larch is invariably the forerunner of the white pine; that it acts as a nurse tree under whose shade the white pine seedlings find just the conditions which they need for their growth; that within fifty or seventy-five years the western white pine catches up with the larch and eventually overtops and crowds it out altogether. It was shown, therefore, that there is no danger of the larch monopolizing the entire

ground and preventing the white pine from coming in. This led to a change in our silvicultural practice. Instead of sacrificing the larch—a tree of the future which probably in the next ten years will come into its own—as well as rendering unfavorable the conditions for regenerating the pine, most of the larch is now left on the ground to wait for a better market and meanwhile act as a protector to the young pine growth. In this case the practice of silviculture not only meant better reproduction of the forest, but also greater revenue to the government and simpler and cheaper logging to the operator. This silvicultural practice is as advantageous on privately owned pine-larch forests as it has proved to be on the government owned forests. As a matter of fact it was the observation of what follows the cutting out of the pine and leaving the larch, as practiced by lumbermen on their own lands, that led to the conclusion that such a practice is not only economical and profitable, but also silviculturally sound.

In Hand With Logging.

These examples, I believe, show that silviculture must go hand in hand with logging. If I may be allowed some paradoxical definitions, I would define "silviculture" as logging that leaves the ground in a condition capable of restocking; and would define "logging" as the practical application of silviculture. To be a successful logger of lands which are to be retained in forests one must be a keen silviculturist, and to be a successful silviculturist one must be a skilful logger. Therefore, when lumbermen tell you that the kind of foresters they want are those who can log and not those who know silviculture, and yet profess that they wish to keep their woods going and producing timber, they are not picking the right man. This misconception of what silviculture really means and its possible place in our present day logging operations on land that is more profitable for timber growing than for agriculture, has led many a timber owner to give up silviculture as an impractical and unprofitable thing, and many a forester to become discouraged in the future of his own profession. Even some forest schools have fallen victims to this misconception, and, instead of training men thoroughly grounded in fundamental knowledge and thus adapted to the practice of the kind of silviculture which is really needed, have begun to flirt with logging engineering, blacksmithing, and what not; and apparently are trying to develop a new type of professional men—a cross between a lumber jack and a "half-baked" engineer. And this forest school product is what they adorn with the diploma of bachelor or even master of forestry. There are already enough lumber jacks and mediocre engineers in the world, and no high grade school is needed to produce them. Engineering as a profession is now so highly developed that anyone who really wants to become proficient in it and specialize in logging machinery and other phases of logging engineering, will find a technical school of high standing better suited for his purpose than the average forest school as now organized. The result of such a flirtation, I fear, can be only that these forest schools will produce neither good engineers nor good foresters. The country does need, however, professional men who have a clear understanding of the limitations which economic conditions of the lumber industry impose upon the practice of silviculture, who have a fundamental and thorough training behind them, who are free from doctrinairism who are capable of evolving simple and practical methods of utilizing our woods and at the same time providing for their perpetuation.

(Continued in September Issue.)

RENNIES SEEDS
PUREST-CLEANEST
MOST RELIABLE
GET CATALOGUE
AT BEST DEALERS
OR DIRECT
TORONTO - MONTREAL
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Ontario Editors Demand Reform of Ontario's System

A Few Lines From Some of the Critical Comments in Ontario Newspapers Since the Forest Fire Tragedy

"Ottawa Evening Journal," Aug. 1, 1916: Ontario is the only province without a brush law. Let this grim tragedy be the last to blacken the annals of the Northland. Life and property must be made safe, and it is up to Ontario to grapple with the problem. Make good laws and enforce them.

Settlement of the North.

Toronto "Globe," Aug. 2, 1916: The clearing of land by fire, except under the direct supervision of competent Government overseers, should be absolutely forbidden. It is forbidden in almost every other part of the continent except Ontario.

Must Fight Fire.

"Toronto Daily Star," Aug. 1, 1916: We must fight fire as we would fight the invasion of a foreign army. The actual money loss caused by a great forest fire is far beyond the most liberal expenditure for protection.

Insurance Must Be Increased.

Toronto "Mail and Empire," Aug. 2, 1916: Whatever the cause of such disasters, the insurance against further experiences of them must be increased, regardless of cost. The settler must be assured, so far as it is possible for public regulation and efficient public service to assure him, against the contingency of forest fires."

Where Ontario Stands.

"Financial Post," Toronto, Aug. 5: Despite the awful warning of the catastrope of five years ago, the evidence is not wanting that the necessary and obvious precautions for the protection of Ontario's citizens and Ontario's public domain have not been taken. We cannot imagine the officials of any efficinetly operated private corporation, with the same resources at stake as those of the province in the Northern district, neglecting to take every possible precaution for the protection of their assets.

The Tragedy of the Empty Bottle

It is a real tragedy to find the bottle empty when you need Bovril. You may want Bovril quickly in illness. You may need it badly for the meal you are cooking—for your soup or your stew. So keep Bovril at hand.

What Ontario Needs.

Peterboro "Times," Aug. 5, 1916: The Ontario Forest Protection Service stands urgently in need of three main reforms which, year after year, have been urged upon the Governments by the Canadian Forestry Association, the Commission of Conservation and other bodies:

1. Remodelling of the ranger service so as to give real protection to the forest wealth of the province. The Ontario system is recognized generally as out-of-date and inefficient.

2. The employment of inspectors in the ratio of at least one inspector to ten rangers. Over an area of 10,000,000 acres, Ontario has just eight supervisors, each being required to manage on an average of 36 men.

3. Sufficient rangers must be provided to completely patrol the Clay Belt, and these rangers must have authority to control the burning operations of settlers.

The Government's Part.

Toronto "Globe," July 31, 1916: The clearing of land is like reforesting—a matter for Governmental supervision. The danger of clearing by fire needs no argument, but the injury is not fully appreciated. The knowledge that ashes are a fertilizer has caused much mischief. The burning often does vastly more injury to the soil than the ashes can restore.

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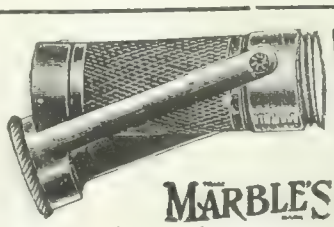

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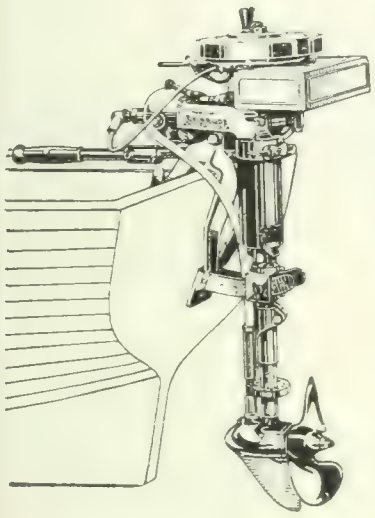

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"A Provincial Disgrace."

"Ottawa Evening Journal," Aug. 1, 1916: In the matter of forest fire protection this province has shown amazing lack of progressiveness and intelligence.

It is doubtful if there is a community on this or any other continent that has suffered more in life and in treasure in recent years from forest fires than the province of Ontario. It is certain that none has shown greater feebleness or negligence in dealing with the problem.

Ontario has been content to get along with a fire protection system that does not protect.

Ontario has displayed a carelessness or worse that has been nothing less than disgraceful.

What the province needs is something in line with the system adopted in many of the States of the Union to the south and in some of our own provinces that Ontario complacently regards as unprogressive.

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A More Effective Policy Needed.

Peterboro "Examiner," Aug. 2, 1916: We have a duty to urge upon the Government a more effective and energetic policy of prevention. It is not to be denied that the Province of Ontario has not dealt with the menace of forest fires with the energy and completeness of other provinces.

Ontario Is Lagging.

"Industrial Canada," July 31, 1916: Ontario's forest protection system has witnessed little alteration in design for thirty years or more.

The Harvest of Forest Fires.

"Pulp and Paper Magazine," Montreal, Aug. 15, 1916: Vast areas of our north land have been swept bare of trees and have become barren wastes. Much of this land is unfit for cultivation, and once the trees have been destroyed, the shallow soil washes away and we have nothing but bare rocks and desolation.

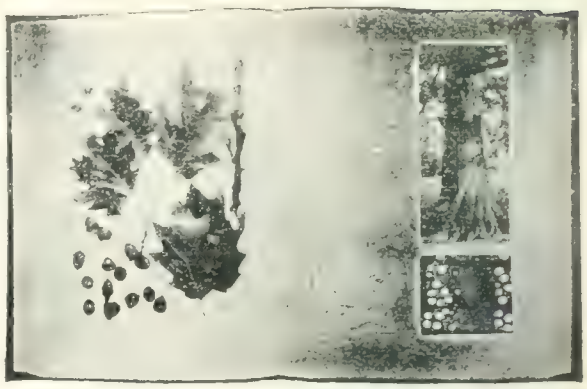
An Incontestable Fact.

"Ottawa Citizen," Aug. 1, 1916: The fact remains incontestably that the Provincial Government has never really taken the problem of fire protection in Northern Ontario seriously.

The one step which should by all means be taken is the passage of an Act providing for the adoption of the settlers' burning permit system.

Must Be Some Way.

Toronto "Mail and Empire," Aug. 10, 1916: The man who has some acres of slash is inclined to be self-willed in regard to applying the match. There must be some way of establishing an iron authority over such men. It is surely better that half a dozen should spend the remainder of their days in prison rather than fifty times as many should perish in forest fires and a hundred times as many be left in a state of ruin.



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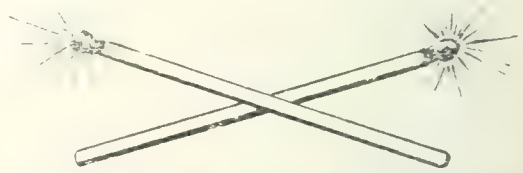

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Hard To Learn a Lesson.

"Toronto Daily Star," Aug. 12, 1916: We need men who will handle the fire danger in New Ontario—men who will say that such disasters as those of 1911 and 1916 can be prevented and must be prevented.

In Periods of Drought.

St. Catharines "Journal," Aug. 5, 1916: Ontario, particularly in the Northern Clay Belt, has practically no ranger patrol, carries on no preventive campaign, and offers no opposition to the wholesale use of fire by settlers for clearing their soil of tree growth.

The "Blessings" of Fire.

"Christian Guardian," Aug. 9, 1916: We agree with the Canadian Forestry Association that it is foolish to speak of the blessings of the recent disastrous Northern Ontario fires. The loss resulting from such a fire is a very serious one indeed, and, say what you will, it is a preventable loss. Stricter regulations as to settlers' fires such as prevail in other parts of Canada would help a great deal. Why Ontario does not adopt such regulations is difficult to understand.

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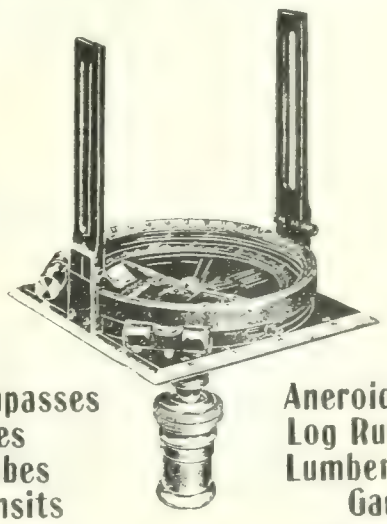

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Liberty of Settlers.

Stratford "Beacon," Aug. 5, 1916: The recent forest fires in Ontario have brought out the inadequacy of the present system very clearly. Settlers are apparently at liberty to burn slash without any special restriction being put upon them, whereas in the Province of Quebec, in British Columbia and in several States of the Union, a license must first be obtained before such fires are set out. The result is seen in the freedom from forest fires of these States and Provinces. What has been destroyed would pay the cost of an army of rangers and inspectors.

The North Land's Reputation.

"Toronto Daily Star," Aug. 1, 1916: The great fire in the north country will have the effect of injuring the reputation of that region unless the Government can take such measures as will make it reasonably certain that similar disastrous fires cannot again occur.

What About the Next Forest Fire?

"Ottawa Evening Journal," Aug. 12: What guarantee will be given by the Ontario Government that 1917 or 1918 or any future year of great drought will not repeat the unspeakable horrors which have just been enacted in the north? Above and beyond every other question, that one must be answered before the confidence of the settlers in the Clay Belt can be restored.

No settler should be allowed to start a clearing fire between April and November without a permit from a qualified ranger.

One Real Benefit.

Montreal "Financial Times," Aug. 5, 1916: The disaster will not have been wholly in vain if it results in a determination on the part of Canadians to engage in conservation work for the prevention and limitation of forest fires upon an unprecedented scale and with unheard-of energy.

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Repetition Unnecessary.

Kingston "Whig," Aug. 3, 1916: According to A. C. Clark, a manufacturer of lumber and wholesale dealer in it, the Ontario Government is largely to blame for the holocaust which has recently swept over Northern Ontario. Mr. Clark said that educative campaigns should be conducted among the settlers in these regions. The government is busy in carrying relief to the settlers. The point is that it must get busy in another way and by its vigilance guard against a repetition of the disaster.

Detect the Fire Early.

Cobourg "World," Aug. 4, 1916: It is evident that some system will have to be established whereby to detect and to fight forest fires before they assume dangerous proportions. The resources of civilization must be put under levy to protect the settlements.

Opinion in Dundas.

Dundas "Star," Aug. 3: No man cares to take up land and make improvements while constantly under the risk of having everything swept away without a moment's notice.

There will always be forest fires so long as the work of prevention is left in incompetent hands.

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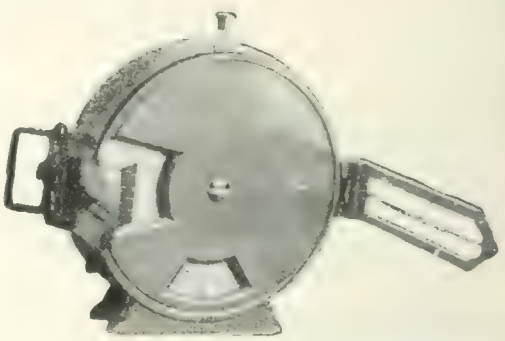

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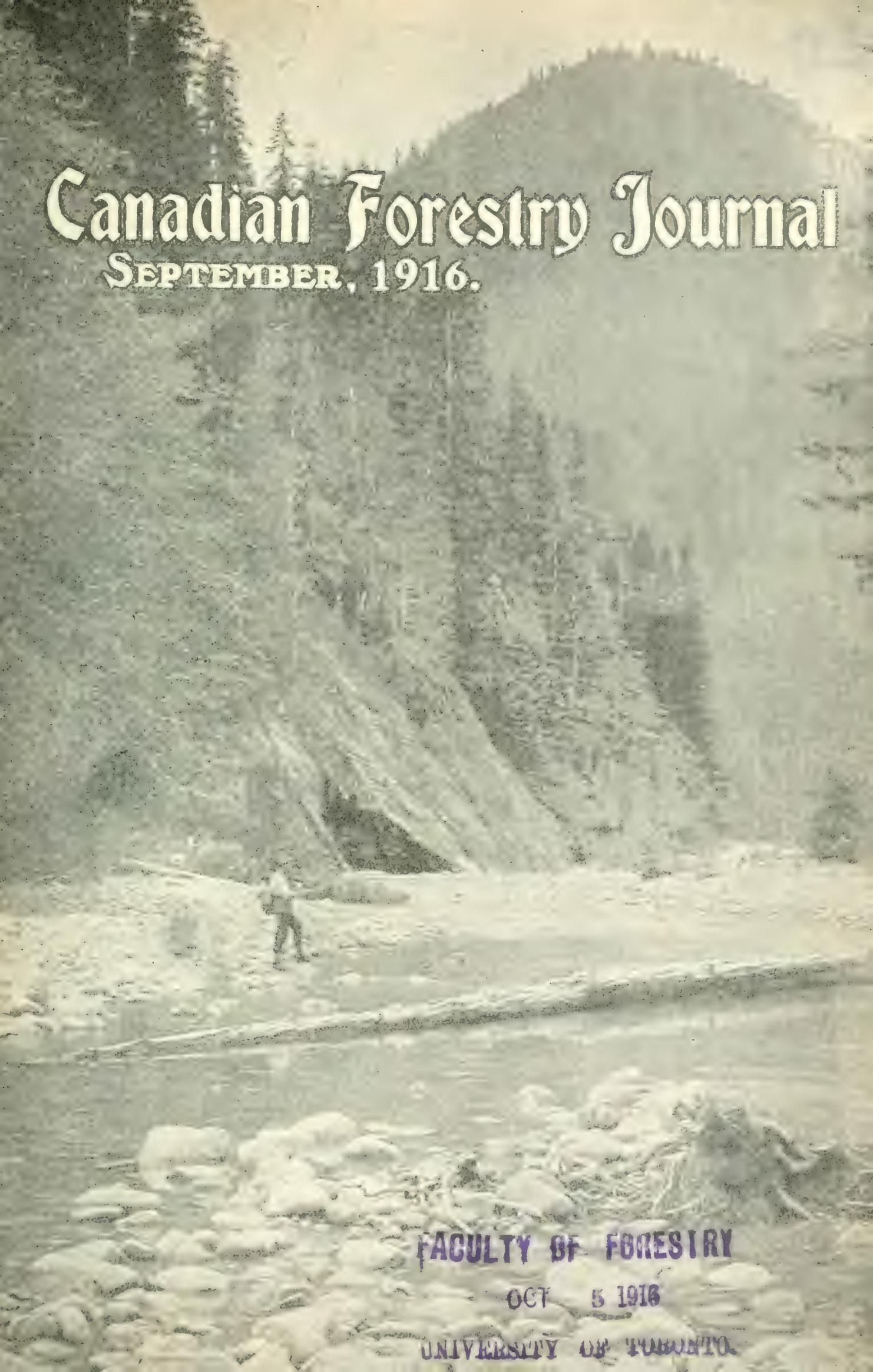
SEPTEMBER, 1916.



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VOL. XII

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How Firewood is Utilized in European Forests

(Courtesy of "Forest Leaves.")

PEASANT CARRYING FAGGOTS HOME FOR FUEL.

A mixed beech and oak forest typical of Belgium, France and central-west Germany. Competition is keen for the privilege of collecting the branchwood, and as a result the forests are clean and the forest hazard reduced to a minimum.

(Courtesy of "Forest Leaves.")

A SUPPLY OF WOOD FOR SUNDAY.

Peasant women of western Germany returning from the communal forest with pine branchwood which they were allowed to gather on Wednesday and Saturday afternoons.

How to Plant Trees in the Fall

Expert Instructions on Time to Plant, Selection of Trees and Precautions in Tree Removals

By B. R. Morton, B.Sc.F.,
Dominion Forestry Branch, Ottawa.

The planting of any tree is best done at a time when it is making no growth, either early in the spring before the buds open or in the autumn before the ground freezes. Evergreens, such as the pines or the spruces, can be planted with more or less success during the summer months, but it requires extra precautions to be taken and should be avoided if possible. Broad-leaved species such as maple and elms should never be planted when in leaf, that is, while the leaves are still green and active. It is not necessary to wait until every leaf is shed. Some trees, like the oaks and the beech, frequently retain many of their leaves throughout the greater part of the winter. Spring planting usually gives better results than fall planting. Spring is the season of most vigorous growth, and planting at that time gives the tree an opportunity to establish itself, and the soil a chance to become thoroughly settled before the winter. There is then little danger of the trees being heaved by the frost. However, if proper precautions are taken, there is little risk of serious loss as a result of fall planting.

Selection of Trees.

In buying trees, other things being equal, it is advisable to order them from a local nursery. This reduces the risk of loss during transportation, and enables one to visit the nursery and make the selection personally.

In selecting a tree, a compact root system is of great importance. The more small roots a tree has the greater its chance of surviving the shock of transplanting, and the more rapid will be its growth. A large top is desirable provided there is an abundance of roots. A tree with many branches and few roots will make very slow growth if it survives at all. A tree which has lost many of its feeding roots is unable to meet the demand made by the branches, and it is therefore necessary to remove a proportional number of the branches to restore the balance.

No matter how carefully a tree is dug up many of the roots are sure to be broken off or injured. The larger the tree the greater the loss of roots and more severe the pruning required. The removal of four-fifths of the past season's growth from all branches will be sufficient with trees not more than three or four years of age. The cut should be made just above some strong bud. Care, however, should be taken not to destroy the leader or main stem. All broken roots should be trimmed to enable them to heal. All cuts should be made by a sharp knife and be smooth.

The Single Leader.

It is frequently impossible to trim an evergreen tree without permanently destroying its value for ornamental purposes. Therefore greater pains should be taken to secure

a larger proportion of the root system with these trees.

Only trees with a well-developed single leader or main-stem should be chosen. Those with two or three leaders will probably develop into crotched trees and have all the weaknesses of that type. However, by careful pruning as the tree develops, the central stem can sometimes be encouraged to become the leader.

A good straight leader like a whip-stalk or fishing pole is what is desired for the ideal street or lawn tree. For planting adjoining walks, where head room is required for pedestrians, a straight stemmed tree from one to one-and-one-half inches in diameter at breast height, and clear of branches for at least seven feet from the ground, will be found most suitable. If the tree is set near a driveway it may be necessary to gradually remove the lower branches as the top develops until there is ample clearance for vehicles. On lawns and other open situations the lower branches may be retained if desired.

One of the commonest mistakes made is in choosing large trees. The smaller the tree the less likely it is to suffer in transplanting. Small trees will often catch up to larger trees in a few years.

On Arrival From Nursery.

Trees are shipped from the nursery in bales or boxes with their roots packed in wet moss and wrapped in burlap. The stems are sursounded with straw and also wrapped and tied. If they arrive before planting time the roots should be "puddled" and the trees "heeled in." Puddling consists in dipping the roots in a mixture of clay and water about the consistency of ordinary paint. This forms a coating over the roots and aid in preventing them from drying out. The heeling in consists in digging a trench sufficiently deep to contain the roots with moist earth. If protected from damage by rodents and the elements, they may be heeled in during the fall and left all winter for spring planting.

Taking Up Trees.

In taking up trees which are growing on the place, as much earth as possible should be removed with the roots. This prevents the roots from drying out. If the trees are to be carried any distance before planting again it is advisable to wrap the ball of earth in canvas or place each tree in a bag and tie in such a manner as to prevent the earth from being shaken off. At no stage in the taking up, transplanting or planting should the roots be allowed to become dry. This is important. The planting should be done as soon as possible after taking up.

Preparing Holes.

The hole in which the tree is to be planted should be made much broader and deeper than is necessary to accommodate the roots. Before placing in the tree, the hole should be partly filled in with good garden loam or some of the surface soil, which has been removed in the digging, mixed with some well-rotted manure.

The hole is filled in sufficiently deep to bring the tree to the same level at which it stood before being taken up. The tree should not be set deeper than it stood before, neither should earth be banked up about the stem, except possibly in the case of fall planting, when it is advisable to heap it up at least a foot high until the spring. This overcomes the tendency to heave out and to a certain extent affords protection against mice.

If the tree retains a ball of earth about its roots it can then be set in the prepared hole. The remaining space surrounding it is then firmly packed a little at a time with good garden loam until the hole is com-

pletely filled and the tree firmly set. It is well to leave an inch or so of loose earth over the whole surface to act as a mulch .

In fall planting a layer of manure or dead leaves over the top will reduce the chance of heaving in the early spring.

Trees without earth about their roots should be set in a similarly prepared hole so that the roots spread naturally and are not twisted or crowded. Rich soil should then be sifted over them, a little at a time, and firmly worked in among them with the fingers or a pointed stick. This is proceeded with until the hole is filled. It is important to have the soil well packed about the roots.

Before Pruning.

Pruned Before Setting Out.

In setting a tree care should be taken from the very start to see that the stem is kept perfectly vertical. Attempts made to straighten it after the earth has been packed about the roots are liable to injure the tree.

Work of Staking.

After the hole has been filled in, to prevent the tree from getting out of vertical by settling of the earth and the swaying of the top in the wind, a guard stake should be used. A single stake is sufficient for any situation in which there is little danger from damage by children or vehicles. Otherwise, a secure crate the full height of the trunk should be constructed about it. The single stake should be long and rigid enough to be driven at least two feet into the ground and still support the tree six or seven feet above the ground. The tree should then be attached to the stake in several places. A piece of manilla rope run through a piece of old rubber hose which has been bent about the tree serves as a good fastener. The hose minimizes the chafing.

Canada's Pulp Exports.

A Washington despatch to the New York Sun says:

"Over two-thirds of the more than a billion pounds of wood-pulp imported into the United States during the fiscal year ending June 30, 1916, and used in the manufacture of paper, came from Canada," according to a communication to the National Geographical Society from John Oliver La Gorce and issued by the society as a bulletin in connection with the government's inquiry into the increase in the cost of newspaper.

"The pulp importations for 1915-16 have been 180,000,000 pounds less than for the previous twelve months, yet the amount shipped to us from Canada during the past year was 130,000,000 pounds in excess of her 1914-15 shipments.

"During the year just closed nearly 70 per cent. of our 1,135,000,000 pounds of pulp came from our neighbor to the north, while most of the remainder came from Norway and Sweden."

Preparedness Needed.

(Berlin, Ont., Telegraph.)

"Manifestly what Northern Ontario needs as a permanent policy is one of preparedness against forest fires, and it is equally manifest that the villages and towns of our hinterland have had no such policy in the past. Had the reverse been the case the terrible conflagration and holocaust of last week might have been averted, and this land of promise saved from a disastrous blow from which it will take many years to recover."

After enumerating the reforms asked for by the Canadian Forestry Association, the Telegraph continues:

"It is a thousand pities that these precautionary measures have not been adopted, and the Ontario government cannot escape a certain amount of responsibility in connection therewith, but there will be a criminal responsibility if there is any further neglect in this all-important matter."

Placing Responsibility.

(Canada Lumberman.)

We often hear it said that the fire ranging problem is too great to be solved, that it cannot be handled effectively. There is no truth in this statement. It is the excuse of incompetence or indifference. It is simply a question of organization and the employment of experienced rangers.

"The timber owners of Northern Ontario find the Government unquestionably guilty of neglecting their duty, and alone responsible for the great losses that are so frequently sustained by the timber owners and settlers themselves. These timber owners have shown the Government how to handle the problem and they are naturally indignant at the feeble manner in which both the present and all former governments of Ontario have dealt with the situation."

A Visit to the Devastated Claybelt

Officers of the Canadian Forestry Association Find That Sentiment in Northern Ontario Favors Restrictive Legislation

The Canadian Forestry Association, through two of its officers, made a prelimnary investigation of fire conditions in the Claybelt region between Haileybury and Cochrane on the T. and N. O. Railway during the week of August 14th. Personal observation along the main and branch lines of the railway and some miles into the back country and numerous interviews with settlers, government employees, railroad officers, merchants, etc., strongly supported the Association's contention that Northern Ontario need not suffer another catastrophe if the Provincial Government at once reorganizes its protective system on really modern lines.

Danger Ahead.

It was everywhere admitted, with the possible exception of the Matheson district, where the country is stripped, that the risk of fire in future years has been greatly increased by the killing of so much green bush during the past month. The dead, and therefore very inflammable spruce forests, which now lie across so much of the farming country from Matheson northward, add an element of decided danger to the situation as it was a few months ago. It is well known that it usually takes no less than three or four successive fires to thoroughly clean up an area of standing timber. How to offset these perils to life and property is a problem which can and must be solved by the Department of Lands and Forests of Ontario. The Claybelt has had scarcely any fire protection worthy the name, except immediately along the railways, and the Department tacitly confesses that this section must take its own chances. The harvest of that policy has been so gruesome and costly that the forethought of the Government in the matter of rehabilitating the settlers will logically extend to giving their lives and their homes a reasonable guarantee of fire immunity for the future. Toward that sensible goal, all true friends of Northern Ontario are eagerly looking.

A Safe Claybelt.

The disaster of July 29th, 1916, had its origin with settlers' slash fires. That point is undisputed. The remedy for bush fires must start with the cause. Wider clearings to protect the towns are an obvious necessity, easy to accomplish. But the safety of the settler in the heart of the bush is another and more serious problem. The average settler is, to a considerable extent, an isolated unit. He must do his own clearing. After two or three years' work, from 70 to 80 per cent. of his homestead usually remains in bush. He uses fire to rid his soil of the encumbrance of slash and stumps, and fire is plainly a necessity for such a purpose. It does a valuable service in clearing that particular piece of land of the overlying debris. It does no genuine permanent service, and often does untold injury when it escapes from the clearing into his green bush, for it destroys the trees as marketable pulpwood, and quad-

ruples the perils of the next dry season. These escaped fires caused the horrible swirl of destruction that passed across 1,200 square miles of Ontario a few weeks ago, causing the loss of more than 250 lives, with a recurrence last week in the vicinity of Haileybury which took an additional toll of 12 lives and caused a further large exodus of settlers from the country.

Origin of Disasters.

Government control of all settlers' fires means a safe Claybelt. A controlled fire, as understood by forest protective systems in nearly all parts of the world, spells careful, safe. economical burning of slash, as opposed to the imperilling of thousands of lives and millions of dollars' worth of property by indiscriminate burning at any time the settler may choose.

Many settlers in Northern Ontario exert great care when burning off their slash. Others deliberately encourage the fire to do its worst for themselves and neighbors by lighting their fires in times of drought and wind, and "coaxing" the flames beyond their clearings. From these careless and thoughtless people the wise and cautious settler has absolutely no protection under present Ontario laws or administration. As an individual, he can watch only his own conduct. For the criminal conduct of other people he reasonably looks to the Ontario Government, the trustees of his lands and personal safety, the designated guardian against the menaces of forest fire.

Two Evictions by Fire.

Life and possessions are as precious to the North Ontario settler as to the southerly townsman. He is being asked to-day to return to his home in the bush. to make a fresh start after two evictions by forest fire in 1911 and 1916. Is his request excessive that he should enjoy as good fire protection through the bush areas as his fellow settlers in parts of Quebec, and New Brunswick, or the whole of British Columbia and Nova Scotia?

Is this a reasonable proposal? Since settlers' fires are admittedly the most formidable source of trouble, the remedy must start precisely at that point. The wise and careful settler must be encouraged. His conduct must be made the standard of the whole Claybelt.

First of all, the Legislature of Ontario should pass a law—there is none in existence to-day—prohibiting the use of fire for clearing land in those spring and summer months of highest danger throughout the North Country, except by consent of a skilled ranger. How will such a law affect the settler?

How the Plan Works.

Look into British Columbia or Nova Scotia or sections of Quebec! A law is, of course, merely an instrument. It requires tactful but thorough enforcement by competent and experienced officials, to be of the slightest avail. The settled parts of Ontario's forested territory will have to be organized for patrol purposes. No one even pretends that the public-owned and partly settled bush lands of the Claybelt bordering the T. and N. O. and Transcontinental Railways are adequately patrolled, aside from the railways' right-of-way. In other provinces, fire rangers are assigned to such districts, and these men quickly make themselves known to all settlers under their jurisdiction. Their presence itself is an advertisement for carefulness. When a settler is prepared to make a burn he hails a ranger, satisfies him that he has complied with the simple conditions of safety. such as piling part of his slash or making fire guards about the edge of his clearing, and gets forthwith a written "permit," providing the weather conditions are

favorable. There is no red tape, no fee to pay, no long waiting, and the stipulations of the ranger are such as should appeal to any reasonable man.

What Others Say.

Wherever the Permit System for settlers has been tried, it has proved remarkably efficient in holding down the dangers of forest conflagrations. No province of Canada, no state of the American Union, that has adopted the system could be persuaded to forego the blessings of it, and the settlers in these provinces and states would be the last to invite a return to the hapless conditions that thus far obtain in Northern Ontario.

$300,000,000 for Lumber to Repair Wastage

The Wall Street Journal recently published the following in regard to the lumber that will be needed in the reconstruction of the war-swept portions of Europe:

"When Europe begins the work of reconstruction an immense amount of lumber will be needed. So, too, South and Central America, which have heretofore been importers of lumber, must again call for the material as soon as ocean transportation facilities permit. An immense market for lumber should then develop. The man who has money to invest may find it worth while to consider this demand, and the possible source of supply.

"A bird's-eye view may be had by looking at San Francisco, Baltimore or Messina. For instance, in the year following the earthquake Italy imported lumber to the value of $33,000,000. The amount that went to Messina district was 700 times greater than normal. Set Belgium, Northern France and Poland in opposition to Messina, and $300,000,000 worth would seem ultra-conservative, although any figures at this time must be largely guesswork.

"It is certain that building activity has almost ceased in Great Britain and France. It is a fair inference that the same conditions exist in Germany and Austria. It would seem as if all the belligerents are too busy making and expending ammunition to find time to saw up boards for industrial use. South America is at a standstill, not because it does not want the lumber, but because of war's disarrangement of transportation.

"The United States, Canada and Russia are large producers of lumber. But in the United States there is a large population of lumber consumers. The annual cut now is 15 per cent. less than five years ago. Our share of the world export trade is above $100,000,000 a year. Since the war it has been reduced nearly one-half. What is supplied for European rebuilding must be at the expense of our domestic needs.

"A promising source of supply is in Central Russia, Siberia and the Caucasus. Russia itself will consume enormous amounts of lumber, but this is a source in which she is rich. The timber is there, and the market soon will be. The lumber business in Russia is, however, conducted on lines as out of date as its agriculture. If there be any Alexanders among the lumbermen of the United States, in the forests of Russia they may find new worlds to conquer."

What the Settlers' Permit Plan Actually Accomplishes

The Testimony of Hon. Jules Allard; E. T. Allen, of Portland, Ore.; the B.C. Forest Service and Others

That settlers' clearing fires have been responsible for incalculable forest losses in most of the forested provinces is a fact recognized by the Governments of British Columbia, Quebec, New Brunswick and Nova Scotia, and indeed by the prairie provinces, and laws have been passed to bring private burning operations under official control.

Ontario, however, has paid little heed to these evidences of progress on the part of its neighbors, so that the holocausts of 1911 and 1916 in the North country (having their origin in settlers' fires), were allowed to pass without any assurance of improved laws and administration. The storm of protest from the Ontario newspapers and many public bodies cannot but have its effect. Indeed, it is not too much to predict that the next session of the Legislature may witness a new law providing for control of settlers' fires. If such a law is supported by an administrative system radically altered from the present outworn idea, the Province of Ontario will begin to experience the benefits of a genuine scheme of fire prevention, certain to save hundreds of lives, and millions' worth of property.

Following are some concise testimonies to the usefulness of burning permits in other parts of Canada and the United States:

Quebec's Experience.

"After a careful study of the question," writes Hon. Jules Allard, Minister of Lands and Forests, under date of August 29th, 1916: "We came to the conclusion that the most efficient means to protect the forests from damages caused by fires set by settlers in their clearings, at the same time fostering the agricultural development of our Province, was the Permit System.

"This year, although we have not yet received all the reports, I can safely say there must have been over 2,500 permits granted. There has been no damage caused by fire for clearing purpose made in virtue of these permits."

In the Western States.

A letter to the Secretary of the Canadian Forestry Association from E. T. Allen, Forester of the Western Forestry and Conservation Association, which administers a thorough forest protection system in the Pacific North-western States, carrying on a vigorous and successful educational work as an auxiliary, contains the following important statements, under date of August 29, 1916:

"I can testify very gladly that in our Pacific North-western States the burning permit is as accepted a part of fire prevention as patrol or fire fighting. None considers abandoning it. Its effectiveness comes in many ways besides through direct prohibition, enforcement and penalty. It affords a means of keeping settlers and forest officers acquainted and in touch.. *It pleases the settler because when he receives a permit and complies with its terms he is fairly immune from trouble if his fire becomes unruly. He has largely shifted the responsibility.*

"As to its working, I can perhaps give no better evidence than to say that last year in the State of Washington alone nearly 13,000 burning permits were issued, and under them 118,000 acres were burned over. Here, then, were 13,000 fires in one season under precaution and control which without the law would have been set without precaution and control.

"With a good law and good administration there are practically no difficulties, and most settlers like the protection it gives them against their careless neighbors.

"The permit is an absolute essential of any serious attempt to reduce fire in a developing forest region."

In British Columbia.

"It is safe to say that among the settlers, 90 or 95 per cent. support this provision (issuing of a permit for clearing fires) and would resist its elimination. From experience gained in British Columbia the unqualified statement is made that unless bush burning is controlled by means of permits no real fire protection is possible in a timbered country.

"It is safe to say that in no country where permits have been used would the people go back to the old system of indiscriminate and uncontrolled burning."

Settlers Co-operate.

From the President of the St. Maurice Forest Protective Association of Quebec (patrolling 12,000 square miles of forested country, much of it heavily dotted with settlement).

August 31, 1916:—"We have been so successful with the Permit System that we would under no circumstances go back to the old way of handling fires. This season we have had absolutely no trouble with the settlers. They have co-operated with us in every way and their satisfaction is universal. So far we have not had a single fire caused by a settler, a most unusual and satisfactory record."

"(Signed) Ellwood Wilson."

Grand'Mere, P.Q.

How to Judge Velocity of Wind

The wide difference between guesses at wind velocity during time when forest fires are raging gives interest to the following table which is taken by the Journal from a report of the United States Forest Service:

Name.	Miles per hour.	Apparent effect.
Light	5 to 15	Moves leaves of trees and small branches, blows up dust.
Moderate	15 to 25	Good sailing breeze; moves leaves and other light objects along ground.
Brisk	25 to 35	Sways trees and breaks small branches.
High	35 to 50	Damages small, frail buildings, grain or hay in field.
Gale	50 to 80	Prostrates exposed trees or frail houses.

Courtesy Grand Trunk Railway System.

Lady Evelyn Falls, Lake Temagami, Ontario.

This Is Worth Insuring.

According to United States Consul Willrich, of Quebec, that province exported over $5,100,000 worth of news-print paper to the United States in 1915. Two years ago, or in 1913, the export of this commodity to the United States was little over a million, so that there has been a remarkable increase in the two years. The consul is of the opinion that the increase will continue, pointing out that the Province of Quebec possesses an abundance of undeveloped water power and practically unlimited forest resources.

The report of the U. S. consul once more brings before Canadians the vision of two choices: a protected and developed forest, adding millions of dollars to the national wealth, or an unguarded forest wherein flames are given freedom to undermine the revenues of present and future.

"The Scythe Tree" of New York.

One of the most unusual incidents of the American Civil War is connected with what is known as "The Scythe Tree" in New York State. When Lincoln made his first call for 75,000 volunteers, James W. Johnson, a farm lad, was mowing grass in a field. Johnson hung his scythe on a Balm of Gilead tree, bade his parents leave it there until his return, and went to the war. All that year and the next, and still another, the scythe hung in the tree until Johnson was killed at Plymouth, N.C., April 20, 1864. The scythe was still left in place in the tree, and meantime the tree grew until but a very small part of the blade protruded from the large trunk about eight feet from the ground. The tree was damaged by lightning during an electric storm this month, but the blade is still embedded in the shattered trunk.

Observations on a Hudson Bay Trip

That some of the territory bordering Hudson and James Bay has been badly swept by forest fires this year is the word conveyed to the Canadian Forestry Journal by Lieut. Chas. McCarthy, Police Magistrate of Elk Lake, Ontario. Lieut. McCarthy recently concluded an enterprising journey from Cochrane to Hudson Bay in search of recruits. He was highly successful, and brought out forty-five.

The journey to Moose Factory took five days, the return journey eight days. The route followed was along the Ground Hog river, past the junction of the Kapuskasing, into the Matagami, and thence past the junction of the Missinabie to the Moose River, which carried the party to the Bay.

Along the Little French river bad fires were visible, and reports of Indians from other districts seemed to indicate that large areas would be burned over in 1916. Lieut. McCarthy confirms the reports of most other travelers passing along the same route, that the tree growth is heaviest at the edges of rivers. Examination of the interior of the country from tree trops and high land showed no forests of large size wood. A report of Explorer La Duke to the effect that beyond the range of vision, some miles back from the rivers, the forests again approached merchantable size, and that the small growth in the muskeg immediately visible was no indication of what the country held, was admitted by Lieut. McCarthy to be easily possible, as he had not examined the interior.

The officer mentioned seeing numerous evidences of wholesale burning in past years. Fires had done their utmost to clean out the country for hundreds of miles ,and as the country was settled only by three or four thousand Cree Indians, no attempt had been made by any government to even educate the natives in guarding against conflagrations. The influence of the tribal chiefs would prove of the highest value in fire guarding, said Lieut. McCarthy, and if the present leader of the Crees at Moose Factory, Chief Wemistagoosh, could be placed on an annual honorarium of a few hundred dollars, he could reduce fire risk better than a staff of imported rangers. The chief was keenly aware of the great damage done annually to the game haunts by fires.

Lumbering Activities.

Says the Canadian official Labor Gazette for August: "Most lumbering districts reported continued activity, although in Northern Ontario considerable damage was done to the industry through ruinous forest fires which destroyed timber and sawmills. At Newcastle, N.B., mills were very active and provided a great deal of work for unskilled labour. In the St. John district, also, active conditions prevailed. Quebec reported mills running to capacity, and on account of a late start owing to high water likely to run on well into the fall. At Three Rivers mills were busy. At Prince Albert, Sask., mills were running day and night and were expected to continue so until freeze-up. Edmonton reported an increased demand for all classes of finished lumber and higher prices. At Fernie, despite the difficulties of fires and floods, the outlook was reported favourable. Post and pole dealers reported the demand keeping up well. New Westminster reported mills active, with a good demand for lumber and shingles."

The Timber Markets of India

By H. R. MacMillan,
Timber Trade Commissioner of Canada.

The use of timber in India is extremely limited. The annual per capita consumption of timber, including all forms of rough wood used for fuel and other purposes, is estimated to be 1½ cubic feet, of which four-fifths is used for fuel. The total quantity of timber used, aside from fuel, is 96,000,000 cubic feet, equal to about 960,000,000 feet board measure, or three board feet per year per head of the population. By far the greater part of this is used in the form of rough logs and poles for building purposes.

This extraordinarily sparing use of wood is due to several causes. The earning power of the population does not exceed 80 cents per head per month, and buildings are therefore small and consist of mud, grass and bamboo supported by a minimum of timber for posts and rafters. Wherever there is population white ants are destructive. Only ant-proof woods can be used for building purposes in India.

Ant-proof Woods.

Ant-proof woods are restricted to a very few native species, chief amongst which are teak, deodar, and sal. These species are high in price both because of the great demand and because of the extremely costly methods of handling timber in vogue in India. Even in a sparsely settled, forested portion of Assam, sawn joists three feet by four inch by 12 feet sold for $48 per thousand feet board measure. Ordinarily rough hardwood logs eight inches to 14 inches diameter sell at the railroad station in the treeles Punjab, India's great wheat-growing district, for $40 per thousand board feet. Teak, which is the universal building timber in the cities, sells at the coast ports at $100 to $110 per thousand feet for small dimension boards and planks. Such prices in a country where the average daily wage is about 4 cents necessarily restrict the use of timber. India is not an industrial country. Fully nine-tenths of the population live directly or indirectly by agriculture. The Indian agriculturist makes his own few tools, has no barns or outbuildings and lives in a mud or grass hut. He gets along without timber.

The Results of Forestry.

The use of imported timber is confined exclusively to the industrial centres, railroads, public works and military necessities. The agricultural population uses absolutely no imported timber.

That Indian forests are able to almost completely meet the requirements of the country for timber is due to the splendid forest administration inaugurated by the British government half a century ago. About 40 per cent. of the country is under forest. The whole of this area is administered carefully to prevent destruction by fire and overcutting, and although at the time of British occupancy the more accessible forests had been almost ruined, wise management has already greatly increased their productivity. There still remain in some provinces, notably in Burma, large areas of hardwood forest, suitable for industrial purposes, which through lack of capital, suitable machinery and equipment have not been rendered accessible.

Matches Are Popular.

It is natural to find, therefore, that the timber imports of India, aside from teak, which is brought in from Java and Siam to the extent of $800,000 to $1,250,000 yearly, consist almost entirely of rough lumbers for temporary uses only, or manufactured wooden articles introduced by Europeans or rendered necessary by the development of industries.

India is probably the only country in the world in which the imports of such articles as matches, boxes and railroad sleepers exceed greatly in value the importations of rough lumber. Matches are the only wooden articles the population can afford to buy. The other articles, together with the common lumber, do not pass into the hands of the Indian population, but are used exclusively in industries, public works or by transportation companies.

Chittenden's Folly.

"In a long editorial the Toronto World gives publicity to a statement by General Chittenden of the United States army that forests are not of use as storage reservoirs for rainfall. Because General Chittenden denies that the forests retain the snow, causing it to melt gradually, denies that the forests absorb more rainfall than the cultivated fields, and takes no stock in the argument that springs and wells dry up when forests are cut down, and calls that part of the forestry propaganda, which goes further than asking for the protection of forests for wood crop a good deal of humbug, the World innocently considers that a myth has been exploded, and that possibly forest fires are rather an advantage. It is fortunate that the conclusions of General Chittenden are so very obviously wrong, that little harm will be done by the publicity that has been given them, or by their acceptance by folks who have never had the opportunity to judge these natural forces for themselves. Our Canadian forestry service is run by very capable men. Men who are living in daily contact with these things and who have splendid opportunity to make a scientific study of them. The same is true of the United States forestry service, and both services are doing their best to convince the nations of the advisability of keeping the land which cannot be advantageously used by agriculturists covered with forests, so as to preserve our streams and our rivers, and to prevent our country becoming, like northern Mexico and the plains of South Africa, hills denuded of soil and a country seamed with dry gullies, aroyas or kloofs."—Montreal Witness.

Saving Lives and Dollars.

(Kamloops, B.C., Standard.)

The great benefit which the Province of British Columbia is deriving from the systematic work done by the Provincial Forestry Department on Provincial lands, and by Dominion foresters in the lands controlled by the Federal Government, can hardly be estimated by one not familiar with the appalling havoc which fire can produce in a forested country.

The recent conflagration in Northern Ontario points to the fact that the British Columbia system of forest protection is well worth every dollar expended upon it. There have been some serious outoutbreaks in this country, but in each and every locality the fire has been put under control before it gained headway. Millions of dollars have been saved to the province and to the lumber industries by the British Columbia staff of fire wardens and rangers, and millions of dollars and many precious lives would have been saved to Ontario if that province had any such system of fire protection as we have in this province.

A Comparison of Provincial Laws

The Nova Scotia Law.

No person shall make, kindle or start a fire for the purpose of clearing land, or other like purposes, nor set up nor operate a portable steam engine within sixty rods of any woods, between the fifteenth day of April and the first day of December next following in any year, without first having obtained leave in writing from the chief ranger or sub-ranger. It shall be the duty of such chief ranger or sub-ranger on being requested to grant leave to start such fire, or to set up or operate such portable steam engine, to examine the place at which it is intended to start the fire, or to set up or operate the steam engine, and the adjoining lands, and the timber, trees and other property thereon, and to refuse such request and decline to grant leave, or to grant it only on conditions to be performed by said persons ,if in his opinion it would not be safe by reason of the danger of fire spreading thereon or otherwise.

British Columbia.

During the close season (between May 1 and October 1) no person, firm or corporation shall set out, or cause to be set out, fires in or near slashings or forest debris, standing or fallen timber, or bush land for the purpose of burning slashings, brush, grass, or other inflammable material, or for any industrial purpose, without first obtaining a permit therefor: Provided that no person shall be convicted who shall have set in good faith and with reasonable care a back-fire for the purpose of stopping the progress of a fire then actually burning.

Quebec.

No person shall, in the forest or less than a mile from a forest, set fire to, or burn, any pile of wood, branches or brushwood, or any tree, shrub or other plant, or any black loam or light soil, or any tree trunk or tree that has been felled, at any time, except for clearing purposes between the 16th of November and the 31st of March of the following year, but between the 1st of April and the 15th of November, it is necessary to first obtain the written permission of the Minister, or of any other officer of the Department thereto authorized by the Minister, or of the fire ranger.

Ontario.

Every person who, between the 1st day of April and the 1st day of November, sets out or starts a fire within a fire district for the purpose of clearing land, shall exercise and observe every reasonable care and precaution in the setting out of starting of such fire and in managing of and caring for it after it has been set out or started, in order to prevent the fire from spreading.

Entirely Reasonable.

St. Thomas "Times," Aug. 7, 1916: The reforms pressed upon the Ontario Government by the Canadian Forestry Association look entirely reasonable, and it is hoped will now receive earnest consideration and result in early and effective action.

What Ontario Needs.

Brockville "Recorder," Aug. 5, 1916: The Ontario forest protection service stands urgently in need of three main reforms which year after year have been urged upon the Government by the Canadian Forestry Association, Commission of Conservation and other bodies.

PROTECTION ON THE T. AND N. O. RAILWAY LINES.

The vigilance of the Temiskaming and Northern Ontario Railway Commissioners in matters of forest protection has received much well-deserved testimony. Above picture shows one of the four tank cars used on the line between North Bay and Cochrane, Ontario. Each car holds between 7,500 and 8,000 gallons of water, and can be easily re-filled at the water tanks. Good service was done by one of the cars at Mileage 133, main line (previous to the holocaust of July last) in extinguishing a fire caused by a settlers' slash. In the judgment of the commissioners the tank cars have already paid for themselves, and will eventually become a piece of standard railway equipment in forested country.

What Guarantee?

Hamilton "Times," Aug. 10, 1916: Despite this devastating fire, the clay belt will be repopulated. Those who escaped are already being persuaded to go back. But what guarantee have they that another fire wil lnot sweep across their land next year or the next? The Government must see that precautions as good as in other provinces are taken in Northern Ontario. Our Government cannot afford to have our settlers burned up in this way when prevention is possible.

Opinion in Peterboro.

Peterboro "Examiner,' 'Aug. 5, 1916: Here we have expert opinon to the effect that forest fires are preventable or possible of great restriction by the simple passing and enforcing of legislation prohibiting the crime of setting out "slash" fires in the height of an unusually dry period. The neglect to take action is little short of criminal.

Community Interests.

Dundas "Star," July 27, 1916: The interests of the community are of more importance than those of the individual and we must legislate accordingly.

"The Clay Belt's" Opinion.

From the Cochrane "Claybelt," Aug. 18, 1916: If the Government should not see fit to introduce legislative measures during the next session to reorganize the obsolete fire ranging system and inaugurate sane fire protective service, the entire North will not rest until they see men at the helm of the Government who are capable of stopping a repetition of the horrors accompanying such devastation as we have now experienced for the second time within five years.

Can Fires Be Prevented?

Winnipeg 'Post," Aug. 5, 1916: One-tenth part of the losses sustained annually by forest fires would provide an army of forest rangers and other means of preventing forest fires or of arresting them when they get beyond control.

Opinion in Woodstock.

Woodstock Sentinel-Review," Aug. 7, 1916: In the light of the statement presented by the Canadian Forestry Association the recent disaster was not merely a disgrace to the province but a crime.

Great Forest Fires of History

It will interest readers of the Journal to know that the Northern Ontario forest fires of 1916 rank as the third greatest disaster in the history of the American continent.

The worst fire of all occurred in October, 1871, in Wisconsin, and was known as the "Peshtigo" disaster, when 1,500 lives were lost and 1,280,000 acres burned over.

In point of lives lost, the Hinckley fire in Minnesota in September, 1894, ranks second, with 418 deaths and 160,000 acres devastated.

The Northern Ontario fire of 1916, including the 12 lives lost near Haileybury in the second conflagration in August, account for probably 260 deaths. About 800,000 acres were burned.

In the famous Miramichi disaster of 1825, 3,000,000 acres of New Brunswick and Maine were cleaned out and 160 lives lost.

The Porcupine disaster in Northern Ontario in 1911 accounted for a loss of about 84 people.

Prompt Action by a Board of Trade

An example of the courageous stand taken by so many of the Ontario Boards of Trade in advocating an overhauling of the Ontario Forest Protection System is contained in the following telegram sent by the London Board of Trade to Hon. G. H. Ferguson, Minister of Lands and Forests, Toronto:

"Minister Lands and Forests, Parliament Buildings, Toronto:

"Concerning Northern Ontario disaster and this Board's resolution previously communicated to you, urging adequate control of settlers' fires, Board asks what immediate steps are being taken to protect lives and property.

"Secretary London Board of Trade."

The Carleton Board of Trade took similar action, and the Fort William Board, the Prescott Board, and others addressed letters to the Minister at Toronto urging a study of forest protection systems in other parts of Canada and the United States, and the application of radical reforms to the Ontario forest service. This action by the Boards of Trade is certain to exert a powerful influence.

Co-operate with Settlers.

(New Liskeard Speaker.)

"There is but one way to proceed in order to reduce the danger from forest fires, and that is by asking the assistance of the farmers. Consult them. Ask their advice. Let them be represented on a Commission to be appointed to give permits to burn over the land intended to be cleaned. This plan would elicit the support of the farmers, and they in turn would help enforce the law. Briefly put, these are the Speaker's views."

[Note: The Permit System of controlling settlers' fires proceeds exactly on the principle advocated above—co-operation with the careful settler.—Editor Canadian Forestry Journal.]

Holding the Camper in Check

The demand throughout Canada that the reins of law be drawn tighter on all users of fire in timbered territory is bound to drive our Governments to more vigorous action. Taking the country as a whole, the great lack is not laws and regulations, but determined enforcement.

Complaints by licensees regarding the failure of provincial governments to deal with the annual peril from campers, fishermen, etc., are too often met with a mailed copy of "Rules and Regulations." The licensee, of course, knew all about these printed prohibitions and cautions, but he likewise knew that a printed law is without effect unless closely administered. Willing to pay for his own rangers and costs of fire fighting, he legitimately protests against the indifference shown to the fire patrol beyond the edge of his limits. Forest protection cannot be effected by patchwork. A mile of carelessly patrolled forest may, and does every summer, threaten the precautions taken on neighboring property. How illogical it is for a provincial government to protest against the cost of forest guarding may be estimated by one instance, when in 1913 a single lumber company lost fully $300,000 of pine and spruce and $19,000 of camp equipment, caches, logging gear, etc., by fires that were started in Algonquin Park, Ontario, presumably by careless campers or other persons on a summer outing.

Complaints from Ontario licensees whose holdings are imperilled by their proximity to the tourist routes in Algonquin Park, have been submitted to the Ontario Department of Lands and Forests, but thus far without promise of better conditions. A letter received from the chief ranger of one of the largest limit holders is given below:

"I want to impress on you that if some steps are not taken by the Government to enforce stricter rules on these tourists going through the Park, some day you will have a big fire. Tourists are allowed to go through the Park without any guides, and half of them know nothing of the danger of fire, and more of them are careless.

"There should be some stringent regulations made and enforced by the Government either to prohibit travelling by these parties in the Park without guides or to put on enough men to police the canoe routes; otherwise you are going to lose that country some day."

Perhaps the compulsory engagement of guides by every party would be too severe in a public playground, but there is nothing to prevent the building of safe fire places along the canoe routes. In Northern Minnesota not only are scores of these fire places built by the rangers but signs are erected to indicate just where they are. Another simple but most effective precaution is to have every party of campers entering the Park, not only at Algonquin Park Station but at all the inlets, indicate the route they intend to follow, and, as these routes are more or less standard with all travellers, rangers could keep close tab of their movements, instruct them when necessary in the danger of carelessness, and exercise in general the functions of police. There is at the present time a system of supervising visitors to Algonquin Park for fire protection purposes. It proves quite efficient as far as it is exercised. But the trouble encountered by licensees in guarding their

property from fires originating with cigarettes, matches, camp fires, etc., indicates how far distant is the full object for which the "Rules and Regulations" were framed.

What the Limit-holder Faces.

The following letter was written August 3rd by a chief fire ranger on Quebec limits to his employers, a well-known lumber firm:

"Where are the fire inspectors and fire rangers for Ontario? I have not seen one since I came on the job, and this A.M. I found a fire that has been smouldering for eight days yesterday, left by a gang of men on a Government job, with a man in charge, or supposed to be. I have all proof that they left it as I see where they boiled their tea and fed their horses. This is the third fire I know of inside of four days.

"I don't know as it is my business to say anything, as it is not in my jurisdiction, being in Ontario; but it is things like this that were the cause of hundreds of lives being lost only a few days ago, and still the fires are not out.

"I am going to get a team to draw some water to put on this fire, as I have it all covered over with earth. It is right in the edge of a heavy slash, and a spruce bush. There is no danger now, until I get the water. Had it got a good start it would with a west wind be on the limits in a few hours."

Helping the Settlers.

The Ontario Government has set aside $100,000 as the first instalment of the money the province is to loan to the settlers of Northern Ontario to enable them to develop their farms. The money has been appropriated under the legislation of last session, and will be turned over to the account of the Northern Loan Commission. Armed with the sinews of war, Loan Commissioner Fred Dane left for the north recently to commence the distribution of loans.

Under the legislation of last session the Government adopted the policy of advancing money to settlers on the security of their cleared land, a limit of $500 per settler being fixed. Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines,, who has the new work in charge, had proposed to put the legislation into effect this summer, and was making the necessary arrangements when the great fire in the north broke out. The Government at once appointed Mr. Dane as commissioner and sent him north. Since then he has been engaged upon relief work, for which the Government set aside $100,000.

With this work well in hand Mr. Dane is now ready to deal with the applications of the settlers for loans. It is estimated that nearly two hundred applications have been received so far.

"The present appropriation of $100,000 is only the first," stated Hon. Mr. Ferguson. "Other amounts will be provided as they are required."

Death of Senator Frost.

Senator Francis Theodore Frost, president of the Frost & Wood Agricultural Implement Company, and a devoted member of the Canadian Forestry Association, died very suddenly at Smith's Falls on Aug. 25.

Senator Frost had been in his office as usual during the day, and had not complained of feeling ill. About 9.30, after spending the evening quietly at home, he was sitting playing solitaire when his wife, who was close by, noticed him topple over in his chair. Medical aid was promptly summoned, but he expired at 1 o'clock next morning.

It was a stroke of paralysis. He suffered one some years ago when attending the session in Ottawa, but then recovered. Hon. Mr. Frost was appointed to the Senate by the Laurier Government in 1903.

Fort William's Energetic Protest

The following letter was addressed by the President of the Fort William Board of Trade to the Minister of Lands and Forests at Toronto:

Fort William, Ont.,
August 11th, 1916.

To the Honorable G. H. Ferguson,
Minister of Lands, Forests and Mines, Parliament Buildings,
Toronto, Ont:—

Dear Mr. Ferguson,—The recent forest fire tragedy in Northern Ontario, entailing such frightful loss of life and property, has served to remind us very forcibly of the representations made to your Government by this Board in the spring of this year, as embodied in memorandum dated 14th February. We feel impelled to renew our solicitations of that date with increased earnestness, that some remedial steps may be taken at the earliest possible moment by your Government to reduce the hazard of devastation by forest fire, and to prevent as far as is humanly possible a repetition of the holocaust which recently occurred in Northern Ontario.

In years past, constantly recurring forest fires have seemed to indicate that our forest protection service had not kept pace with the needs of the province, the need of forest protection has grown from year to year, and will continue to grow just as long as settlers can be induced to locate on timbered areas. The location of settlement on the timbered areas of Northern and North Western Ontario is greatly to be desired, but with their location there comes an added responsibility to those who are charged with the protection and preservation of our forests. As we hope for the settlement of the timbered areas of Ontario, so must we prepare to protect the settler, and teach, or force, if need be, the settler to protect himself from the catastrophe of forest fire. No word of ours can adequately describe the need of the situation, the tragedy recently enacted in Northern Ontario is sadly eloquent.

While it may be true that forest fires cannot be entirely eliminated or their causes entirely removed by legislation, we are convinced that the laws relating to the prevention of forest fires, and the regulations at present existing in the Province of Ontario are inadequate to the needs of the province, and that legislation should be enacted which would prevent many abuses of existing privileges, and remove at least a great number of the causes of forest fire.

Our Memorandum to you of February 14th dealt largely with the commercial loss sustained through forest fires. The commercial loss is indeed great, and it is not our desire to minimize it in the least, but recent events have fixed our attention on the enormous possibilities for the loss of life as well.

We have your assurance, per your letter of May 31st, that the question of fire protection of our forest reserves is receiving the best consideration of your department.

We trust that in the very near future Ontario will be provided with a modern and efficient system of forest protection.

Fort William Board of Trade,
authorized by resolution in
Council, August 10th, 1916.

The Canadian Forestry Journal will be sent to any address for one dollar a year.

Klun Kwot Bay, Moresby Island, Queen Charlotte Group. Hemlock and Spruce Stand.

Naden Harbor Spruce, Graham Island, Queen Charlotte Group.

Masset Inlet Hemlock, Graham Island.

With the Canadian Forestry Battalion

An English Impression of Their Methods and Skill as Recorded by The London Times

"If you would know the lumberman of Canada and how he works, go to the edge of Windsor Great Park, where the cross-road from Virginia Water Station strikes the main road between Egham and Sunningdale. There, on the Clock Case Plantation, you will see over 150 men of the 224th Canadian Forestry Battalion converting trees into railway sleepers and boards at the rate of anything from 15,000 to 20,000 board feet a day.

"The plantation, which forms part of the lands owned by the Crown and administered by the Commissioners of Woods and Forests, includes a considerable area covered with spruce, fir, Scots pine, and larch, with an undergrowth of chestnut. Not very long ago a party of experts looked at the trees with the dispassionate measuring eye of the undertaker ,and gave it as their opinion that from this wood it was possible to get 3,000,000 board feet of timber. To-day whole tracts of it have been swept clear by the axe, and the quaint square tower of the old royal lodge, which stands deep-set in the wood, and which, so the story goes, by its resemblance to the case of a grandfather's clock gave the plantation its curious name, is visible from the roadway for the first time, perhaps, in a hundred years. And still the Canadian woodsmen go on, eating their way through the wood with a thoroughness that knows no mercy.

An All-Canadian Venture.

'The lumber camp is all Canadian —men, machinery, and methods. The men, who are drawn from all parts of the Dominion, have the bronzed, healthy look and the easy, confident swing which we have learned to look for in Canadians. The khaki under their blue overalls proclaims them soldiers; they draw military pay and they know the rudiments of military drill; but first and last they are woodsmen, with their craft at their finger-tips. Every man knows his task and does it with an enviable independence of orders or instructions; yet from the first stage to the last the work proceeds smoothly and harmoniously. Let us follow the process, under the guidance of the officer in charge and the sergeant who is 'foreman of the bush.'

"Facing the main road stands the mill—'home,' the men generally call it—flanked on the one side by piles of logs and on the other by stacks of sawn timber. Walk along the winding track of a light railway, not yet completed, which passes behind the mill, until you come to a clearing, where burning heaps of 'brush' lopped from the tops of the fallen trees are filling the air with the refreshing scent of the pine. Here and there through the blue smoke you catch a glimpse of a lumberman in a picturesque slouch hat. A little further and you are among a gang of 'fallers.' Watch how they fell a tree, 70 inches or more thick at the base.

"A man with an axe kneels at its foot, and with a few dexterous strokes cuts a deep notch in the trunk a few inches from the ground. Two others with a cross-cut saw

cut through the stem on the opposite side. In half a minute the tree begins to lean, and there is a warning shout. A second or two later, with a loud, cracking and rending sound, it topples and crashes to the ground. Without any apparent effort, the 'fallers' have controlled the direction of its fall almost to a foot.

The "Swamper" At Work.

"Next, without any ado, half a dozen 'swampers' set to work with the axe clearing the limbs and straightening up the tree. Simultaneously a 'fitter,' with a wooden rod, divides the stem in suitable lengths, marking the cutting points with a notch; while two other men, one carrying a paint pot, measure the tree, enter the size in a book, and mark the stump and the butt of the severed trunk with a blob of red paint to show that their work is done. Sawyers then cut the stem according to the 'fitter's' marking, and the sections are ready to go to the mill. They are dragged there by horses over deeply scored 'trails' and 'sloopways,' and take their turn to come under the saw.

"The mill itself is a stoutly built structure, made of timber cut and prepared on the spot, and saws and engines coming from anada. It is practically a raised platform covered by an iron roof, but open at the sides. A log to be sawn is rolled into position on a 'carriage,' which moves backwards and forwards to carry it through a circular saw. Two men, standing on the carriage, control its movements and the position of the log by a number of levers. Opposite them stands the most important man of all, the 'sawyer,' whose trained eye sees at a glance what can be made of this or that log. The hum of the engine and the screech of the saw would drown his voice, so he gives his decision by signs. As the carriage brings a log back through the saw with the bark removed, he will hold up one finger or two, and the 'setter' on the carriage, by the movement of a lever, adjusts the log so that the next cut shall be one inch or two inches thick.

"It is all done without a pause. For hours the saw screeches and throws off a spray of sawdust as it slices up the logs that a short while before were splendid living trees, and all the while other saws, trimming the edges of the boards and cutting off the ends, join in the chorus. Is it surprising that the daughter of the keeper of the wood was reduced to tears when she stood by the mill?"

"The Next Dry Summer."

(Berlin Record.)

"In making the effort to have the survivors return and again begin the task of establishing themselves in the burned district the question arises: What protection is to be given them against another conflagration in the next dry summer?

"When, a few years ago, the Porcupine fire occurred with its accompanying horrors, the public felt that it would lead to laws being enacted and enforced which would prevent the occurrence of destructive fires. It has not done so.

"The latest horror was the product of numbers of settlers burning slash, uncontrolled and unheeded for weeks, until they spread and united into one great furnace of flame which nothing could stop."

Changed Positions.

"I feel the same interest in taking part in this conference," said Sir R. Munro-Ferguson, Governor-General of Australia, recently, "as the French ambassador spoken of at a great forestry conference in Washington when I was a little boy. Said the French ambassador: 'I sowed some seed, and they came up so small I could hardly see them; now they are so tall they hardly see me.'"

Bird Protection in Canada

Extermination Threatened for Some Valuable Species—Public to be Won by Aesthetic Appeal

By W. E. Saunders.

Birds, in common with all wild life, are reproducing annually in excessive numbers, and the amount of that excess is governed by the amount of destruction that takes place in the individual species under consideration. As a general rule it may be stated that the total annual death-rate corresponds almost exactly with the annual rate of increase. When it is considered that the annual rate of increase in common birds, such as the robin, is perhaps two, three, or even five hundred per cent., it follows that the annual death-rate is the same. Were it not so, an enormous increase in the number of these species would take place until eventually they would themselves check their increase by their very abundance. This destruction takes place in very many ways. The birds migrate, covering thousands of miles, exposing themselves to very great dangers, often fatal. Besides there are the other fatal conditions to the birds, exclusive of migration.

Aesthetic Importance.

While we have in the past given very great consideration and thought to the economic side of bird protection, yet the aesthetic side is equally worthy, perhaps even more worthy, of consideration than the economic side. A comparatively small proportion of the population is interested personally in birds from the economic side, while there is a large and rapidly increasing number of the residents of Canada and of the civilized world who are taking great interest in the study of bird life, and this study is of very great benefit to the individual as well as to the nation at large. It has a refining influence upon the student and yields an amount of enjoyment which I hesitate to estimate because it is such a personal matter with me. To one who has made a life-long study of birds, it is a very pleasant thing to go into the country and meet at every turn friends whom one knows; it is like going down street and meeting all one's most pleasant acquaintances in one afternoon.

Domestication of Birds.

Probably every bird is capable of partial domestication while in the wild state. I was very much interested a couple of years ago at a meeting of the American Ornithologists' Union in a paper by Miss Sherman on "The Taming of the Wild Humming-bird." I supose the small size of the humming-bird and its almost insect-like character had given me the feeling that it was incapable of domestication or of knowing its friends, but she demonstrated that she had domesticated them to some extent. She actually tamed them so that they came and buzzed around her head for food. She began with bottles of syrup hidden in the base of a gaudy artificial flower; from that she progressed to the bare bottle, and the humming-birds came most freely; they quite expected the syrup, and promptly demanded it from her if the bottle were found at any time empty.

Jack Miner's Experiments.

From the humming-bird perhaps the longest step we can take is to the wild goose, one of the wildest as well as largest of our birds. Jack Miner at Kingsville has the most spectacular demonstration every year on his farm of the possibility of temporary domestication of this bird. One morning last April, 1,000 wild geese came to his farm, all of which lit within 150 yards of his house. Many of them—by actual count 425 geese—were in the small enclosure right in front of his dining-room window. I went into the enclosure with him, and found it quite possible to walk to within fifteen or twenty feet of the nearest goose; but, when those geese were out on the lake, two miles distant, it was exceedingly difficult to get a boat within half a mile of them. In one case, they knew absolutely they were on safe ground, and in the other case they suspected danger, because man is a dangerous animal To them, however, the man who goes around Jack Miner's place is safe, and, therefore, they are not in the least alarmed. It seems that the birds have methods of communication, not only between members of their own species, but with others, because one day during last year's migration, while the geese were visiting Miner's place, on four different occasions flocks of wild swans flew over, apparently to see if these stories the geese were telling about the safety and pleasant conditions on Miner's farm were true. But while the swans found they were apparently true, because the geese were down in the ponds on the farm, they felt like the farmer who, seeing the giraffe at a menagerie, said: "There ain't no such animal." The swans looked at the geese and said: "It looks safe, but cannot be"—and went away. And now Miner's ambition for next year is to have some swans there in order to assure these wild fellows that it really is all right on his farm. Perhaps I might take it upon myself to urge upon the members of the Committee on Fisheries and Game that probably the most spectacular demonstration of protection that you can see on the continent of North America is at Jack Miner's place in Kingsville any day in April while the geese are there. They come in March and leave in May, and the number is limited only by the amount of corn that Miner, who is not a very wealthy man, can afford to feed them. During the migration season last year I believe he fed them about three hundred bushels of corn. That does not cost a great deal of money, but then he is giving it to wild geese and for the benefit of the country at large. I am not sure that in any year I have spent out of my own pocket the value of three hundred bushels of corn for the benefit of the country at large. Of course, Mr. Miner gets personal enjoyment out of it, or he would not do it, and his work with the geese has resulted in an entire change of condition in his township. Settlement banished them, and twenty years ago there were none. When he began his experiments about twelve or fifteen years ago, he obtained a few domesticated Canada geese and kept them in an enclosure, hoping to lure wild geese to visit him annually, but he had the tame ones there for a number of years before the wild ones came. Eventually they did come, seventeen visiting him the first year. The next year there were thirty, then one hundred and fifty, then five hundred in the fourth year, and after that Miner said he could not count them, that he had about "five acres" of geese the year following. It is all very well for a person to talk about quantities of wild geese, but nothing is so convincing as to see them for yourself, and if the members of the Committee could spare the time to visit Kingsville next April, I am sure they would be im-

pressed with the value of even individual effort, though much more could be accomplished if the matter were handled on a little larger scale. On Miner's farm there are two ponds, one, thirty-five yards across, the other thirty by fifty or sixty, yet they accommodated between 1,000 and 1,500 wild geese last spring.

Birds Near Home.

Coming down to smaller things, the protection of the ordinary birds around the home, it is not often that we can get figures that are exact and reliable. In fact, not very many people have tried or have made serious effort to encourage the birds and increase their numbers. But I was told the other day about what seemed to me to be really a very spectacular result. A family, residing in the summer on a little island, about three-quarters of an acre, in the Rideau Lakes, had one or two cats. A visitor there induced his friends to leave the cats at home. Then he began to put up nesting boxes to attract the tree swallows, and they came at the first invitation. Up to 1915, he never got enough boxes up on that island to accommodate the swallows who came. But this year he got up a few more boxes than were needed, and, in seventeen boxes, he had fifteen pairs of swallows on an island that formerly had two cats and five pairs of birds. In addition he had three pairs of orioles, two pairs each of five other species, and one pair each of five others, a total in five years of thirty-three nesting pairs on three-quarters of an acre from a beginning of five pairs. I think that was a very creditable result indeed.

Extermination Imminent.

In North America it has been the habit to await practical extermination before anything is done for the wild things, either animals or birds, with the exception of the game which is so highly thought of by the hunter. In fact there has been so little done for birds that, in the United States, practical extermination has actually taken place in the case of some birds. There are some birds that really require immediate assistance, and, if one ventures to make a prophecy, it must not be considered as exact in terms of years. We can never tell when the last of a species is with us, and, though a species that seems to be in danger of extinction may remain in fair numbers for years without apparent diminution, it may then come to a time when it practically drops out of existence all at once.

Borers in Stanley Park.

(From The Western Lumberman.)

"The destruction being wrought to trees in Vancouver's magnificent natural park by the voracious bark beetle is showing little, if any, diminution as a result of prevention measures carried out during the past two years by the park commissioners, who were guided by the advice given by experts sent here by the agriculture department of Ottawa.

"A more determined effort is now being made to cope with the danger, Dr. Gordon Hewitt, the head of the entomological section, having arrived in Vancouver early in August with four trained assistants, their mission being to make a closer investigation of the extent of the damage already done preparatory to advising the parks board as to the best measures to be taken under the circumstances.

"Dr. Hewitt suggested that the affected trees should be cut down and that Douglas firs should be planted in their places. In a few years, as he pointed out, there would be as fine an array of trees as the citizens of Vancouver could wish for, but under existing conditions there was the probability of nearly every tree being rendered dead, so far as Stanley Park is concerned."

Plain Facts for Coast Lumbermen

"The recent return of Mr. H. R. MacMillan, provincial chief forester, from an eighteen months' tour of many countries as special lumber trade commissioner for Canada, very naturally whetted the curiosity of our leading manufacturers, and no time was lost in affording that gentleman an opportunity to place before them in concrete form the valuable information he had acquired relative to export possibilities by personal enquiry and investigation in the world's leading lumber marts," says the Western Lumberman. Their eagerness to hear the report was only natural, Mr. MacMillan's appointment being the result of representations repeatedly made to both the Federal and Provincial governments that the British Columbia export trade in lumber was steadily dwindling, and that this constituted a grave danger to the prosperity of the industry, the prairie provinces and Eastern Canada being unable at the best of times to absorb one-half the possible cut of the existing mills.

"Mr. MacMillan made plain the fact that it is going to be an uphill fight to increase the sales of British Columbia lumber in the countries already visited—England, France, Holland, Africa, India, Australia and New Zealand, and no doubt the same difficulties will be met with in China and Japan, yet to be covered. The adverse factors are serious indeed, but should not prove insurmountable if our lumbermen are really in earnest in seeking a larger share of the world trade in lumber. Mr. MacMillan declared that almost everywhere the prospects for business were very bright, and that following the war there was bound to be a tremendous demand for forest products, but unless the British Columbia manufacturers are able to sell their lumber on a competitive price basis they need expect no considerable share of the prospective large cargo trade in lumber. Referring to this phase of the subject Mr. MacMillan said:

Must Co-operate.

"'To summarize the result of my investigations so far as the export trade for British Columbia mills is concerned, I believe that unless the mills here can get together and by co-operation in the supplying of lumber, by close study of market conditions—the lumber business is a speculative one to a great extent—and the securing of cargo space, we will not be able to compete with the exporters to the south. In every British territory I visited I found a unanimous disposition on the part of the firms handling lumber to keep their business within the Empire. But they expect, and rightly so, that this inter-Imperial trade shall be done on a business basis, that is, that the British Columbia exporters must give competitive prices; must fill orders according to the specifications, and that the quality shall be what is being paid for.'

"Assuredly the lumbermen must have listened to the following with regret that our fair province is being cheated of the credit which is its due:

"'We, here in British Columbia, are wont to believe that British Columbia lumber is the standard of the world, that everywhere this province's name is known. It will doubtless be a keen disappointment to many to learn that so far as the lumber trade, at least, is concerned, by far the great portion of our exports—I am talking now of antebellum export business, for there has been virtually none since war broke

out—were shipped through United States firms, billed as American lumber. Another fact which impressed itself upon me was that the San Francisco firms which do the great bulk of the export business from this coast are steadily going after the business and getting it.

U. S. Uppermost.

"'I must confess it made me almost indignant when I saw, practically everywhere I went, that the lumber, including British Columbia's product, is sold through United States firms. The importers of the countries did not know that any of it came from this province. We have the raw materials, but sadly lack organization to sell it to the world. In the last twelve years in Australia our lumber exports have fallen from 32 per cent. of the total imports to less than three per cent. Then the business was done by schooners, and the mills here could take the risk of chartering such vessels. Now the business is done in steamers operating by the trip or on time charter, and carrying a large shipment on each trip. In San Francisco and other Pacific Coast ports in the United States the exporters have organized and made a study of the export situation; have steadily gone after the business of the entire Coast. They control the charters, and practically what business British Columbia gets is by their consent.'

Empire Sentiment.

"Concerning the future Mr. MacMillan had this to say:

"'My trip convinces me that the chief competition will come from the Puget Sound, especially for our staple product, the Douglas fir. In Europe such countries as Norway and Sweden will be strong competitors in some lines, but in the bulk of our staple lines their competition will not be serious. Russia is as yet an unknown factor in the export trade. My trip has showed me that everywhere under the flag the people are anxious to buy British products, and if a reputable firm comes along with a product which appears to be equal to what they have been getting they will give that firm the preference over an alien concern.'

Benefit of Brush Disposal.

(From R. H. Campbell's Address before B. C. Forest Club.)

"British Columbia has done some brush disposal, as has also the Dominion. The value of such work in protection is very great. Slashes left from timber operations in many cases make protection an impossibility. We have tried to enforce brush disposal in spruce and jack pine, and in all operations under our control the clearing up is now done fairly well. While there was and is objection by the operators to the disposal of brush, they are learning in the doing of it that it is economically possible and is a great safeguard, and the opposition is growing less. In regard to reproduction the method for securing it has not been thoroughly studied, and in our anxiety to get rid of brush we may at times have interfered with reproduction, but at present we think it better to err on the side of safety against fire.

Another branch of our work is forest investigations. Mr. Miller spoke to you about that work in the Dominion Forestry Branch, and we hope to give that division more attention so as to establish a scientific basis to work on. Most of the investigations at first will, of course, be on Dominion lands. In those provinces where there are organized forest branches they will doubtless handle this work themselves, but we will be equipped to co-operate with them and help them in their work. Then again, we will have to attend to the work in those provinces where there is no forest service."

Forest Fire Damage from Coast to Coast

A Strong Testimony to Thorough Organization and an Indictment of Loose Methods in Forest Protection

The fires in the Lake St. John and Saguenay districts of Quebec undoubtedly have been severe. A statement received by the Journal from a Quebec forest service official asserts that the origin of the trouble was not settlers' fires, but berry pickers. A proposal is now before the Department of Lands and Forests at Quebec to prohibit trespass on timber limits for the purpose of gathering balsam gum and berries.

A series of reports reaching the Canadian Forestry Association indicate that almost the whole Lake St. John region has been on fire, and there has been a fire nearly sixty miles long on the Transcontinental, west of Escalana, and another at Escalana. A fortunate rainfall prevented contact with the limits of the St. Maurice valley. The extent of the timber damage is now being ascertained by officers of the Quebec Government.

Action Needed Here.

Beyond any doubt the ravages of the 1916 forest fires outside the borders of the closely-organized associations (the Lower Ottawa and the St. Maurice) will prompt the Department to take yet another forward step in protecting the timber resources of the province. Hon. Mr. Allard has shown not only a keen appreciation of the importance of the timber assets, but anxiety to apply the most modern and reasonable methods of protection against fire. It is but logical, therefore, that conservationists should look to him for whatever remedy will fit the inequalities now existing in the forest areas beyond the association territories. The Lower Ottawa Forest Protective Association and the St. Maurice Forest Protective Association have built up excellent systems of timber guarding. Their authority, however, applies to their own territory ,and fire is no respecter of human jurisdictions. While these associations can cope with their own troubles, it does not seem fair that they should be constantly on the qui vive, and put to heavy extra expense to save their timber from fires originating in loosely patrolled territory nearby. These protective associations cannot erect a fire wall about their borders. They are continually exposed to fire risks coming from outside. Whether the Minister would favor compulsory organization of all licensees into mutual protective bodies, or prefer to strengthen the present plan of fire prevention everywhere in the "non-mutual" territory is a matter that can safely be left to his consideration.

Thoroughness Wins.

The great point to bear in mind in considering the year's fire record in Quebec Province is that where patrol was thorough, with close inspection of rangers, and aided by the wise Quebec law obliging settlers to secure permits before setting out fires, the degree of protection was excellent.

On 12,000 *square miles of the St. Maurice Forest Protective Association, from April to September, this year, only one fire could be traced to*

human hands. The balance were due mostly to lightning. Considering what this territory has suffered in the past by settlers, river drivers, berry pickers, etc., starting fires when they pleased, and taking no precautions, the showing is nothing short of amazing. The cost of extinguishing fires has been only one-sixth of what it was in 1915. The reader will bear in mind, too, that such a degree of protection has been procured by thorough organization alone, for the territory is as much subject to fire damage as most other parts of Quebec.

Real Fire Fighting.

In the territory of the Lower Ottawa Forest Protective Association, the season's experience has been equally an endorsement of sound organization and muscular management. In August, 35 fires were encountered. Dangerous as these were, they were promptly reported by the rangers, and a body of five hundred men, composed of settlers and lumber companies' employees, were set to work in small detachments. They succeeded in isolating each fire, thereby preventing an amalgamation of fires, and eventually put out all of them. This involved, of course, a heavier account for fire fighting than in 1915, but the fact of first importance is that a negligible amount of green timber was burned. As on the St. Maurice limits, most of the trouble came from lightning, an abnormal condition due to excessively dry weather and a multitude of storms.

Some highly destructive fires are reported by licensees in the Black River and Kippewa district of Quebec. Some of the finest pine in Canada has been cleaned out, and companies are rushing in camps to salvage whatever is possible.

Ontario, outside the Claybelt section, has enjoyed comparative immunity from fire losses this year, and it is doubtful if the total timber damage in the more southerly territory will be any heavier than in 1915, a very light fire year.

Fires in the Prairie Provinces

The fire situation in the provinces of Manitoba, Saskatchewan, Alberta and in the Railway Belt of British Columbia has on the whole been exceptionally good throughout 1916. Wet weather has in nearly all regions prevailed throughout the season, at least up to the end of July. The regular reports do not cover any time later than the end of July, but no word has been received of any serious fire situation occurring in any region during August. The only exception to the above statement has been the district in the vicinity of the Pas, Manitoba, and along the Hudson Bay Railway, where it was rather dry during the middle of the summer, and a number of fires occurred. It has also been dry along the route of the E. D. & B. C. Railway in the vicinity of Lesser Slave Lake and Fort McMurray. There are indications also that unfavorable weather conditions obtained in August in parts of British Columbia, but detailed reports have not been received. On the whole the damage due to forest fires in the territory under the jurisdiction of the Dominion Forestry Branch has been much less this season to date than in any recent year. The wet weather has promoted a very heavy growth of grass and vegetation, and when this becomes dry in the fall, an absence of rain at that time might make the fire situation serious.

The Fire Season in British Columbia

By R. E. Benedict,
Assistant Forester, Forest Branch of British Columbia, Victoria, B.C.,
Sept. 8, 1916.

The late spring throughout British Columbia, retarding the growth of vegetation cover, marked an ominous opening of the fire season. These conditions were alleviated by general rains during the middle of May, although the northern interior did not participate in this to any degree, experiencing hot weather with high winds, and only light and local showers. By the end of the month the situation had become critical ,notably in the Fort George division, and to a lesser extent in the Hazelton forest district, a large number of fires being reported, taxing to the utmost the forest protection organization in the two affected districts. Much timber was destroyed or damaged, some fifteen million feet in all, and several settlers were burnt out.

Many outbreaks having been traced to the work of incendiaries and to persons violating the fire law, prosecutions were set on foot and penalties inflicted, while as a precaution all fire permits in the dangerous areas were suspended. In the southern interior and in the coast districts a cold, wet spring reduced the hazard to a minimum, a rich growth of vegetation acting as a check upon the spread of fires, and by the middle of June danger from the spring fire season was over.

Guards on Improvement Work.

During the spring much activity was shown in disposing of slash under permit, throughout the province, and a satisfactory reduction of this particular class of hazard by settlers, logging operators, road and telephone officials, was made. Not until August did dangerous conditions again manifest themselves, a succession of hot spells occurring, fortunately with rain following, and although several fires broke out in the coast and southern interior districts, they were easily controlled. The comparatively light hazard enabled many of the guards to be transferred to improvement work in their respective districts, cleaning out and constructing trails, repairing cabins and telephone lines; and attending to work of a like character. The cooler nights and heavy dews experienced at the end of August constituted a check upon the spread of fires and caused an absence of other than small outbreaks. In the early part of September a large number of fires in old slashings were reported by the Vancouver district, but these were under control, and, far from doing any damage, were cleaning up logged-off areas.

A Favorable Season.

Barring the rather serious outbreak of fires in the spring along the Grand Trunk Pacific Railway, the season has been a remarkably favorable one from the fire protection standpoint. The reduction in the number of regular long-term fire wardens, rendered necessary through enlistment of many members of the force, and through necessity for economy, was partly balanced by the lessened human hazard, due to the war and economic conditions, and the decrease in transient population. However, the long-term men are only considered as a skeleton force, sufficient to handle the normal hazard, and arrangements were

perfected to employ a large number of extra patrolmen if the weather became dangerous. The need for such an increase in force fortunately did not arise and the regular force were able to readily meet all demands made on it.

In 1915 the cost of fire-fighting, with claims, amounted to $19,449; this year it will, from present indications, not exceed $5,000. Last year the cost of patrol for the season totalled $157,432; this year it will be covered by $135,000. In 1915, the forest protection force, consisting of rangers, forest guards, patrolmen, lookout men, etc., numbered 254, as against the 1916 force of 210 men. The fires reported in 1915 numbered 1,031, but it is not anticipated that when the final returns for 1916 are received the number of outbreaks will reach half this number.

A Northern Ontario Point of View

Absentee Landlords.

It seems rather significant that the settler who has the beginning of a nice clearing with house in it, crop growing, and his family living with him, is becoming insistent that some sort of supervision of setting fires to slash should be made by the government, and that it is the absentee settler who insists on indiscriminate burning of the bush; the man whose family is safely housed in town, and who does not appear himself on his farm, but only to set some more brush on fire when the season is driest and the wind strongest, the man whose sole possessions on the farm consist of a little two-by-four log shack, unfurnished, and like as not half falling to pieces, the man who is holding the land for the unearned increment, and we have rather too many of them around here. We venture to say that if the government would place sane laws regarding fire supervision and fire ranging on the statutes which would make it a criminal offence to set out fires without permit, it would not be the bona fide settler, but the land shark who would have to pay the penalty, and it should be heavy enough to deter others.—Cochrane "Claybelt," Aug. 25, 1916.

What Compensation?

But why should we be so overanxious to want this country denuded of all bush? Where does the compensation come in of wantonly destroying every stick of timber, even if some of it is only scrub, which nevertheless comes in mighty handy for fence work and even fuel. Why not go at once to the prairies, where at least we have the redeeming feature of still having some loam and humus to plow under the clay. Perhaps even around here at Cochrane, where still a lot of green bush is in existence, we do not quite realize what it means to have the country totally denuded right down to the bare clay, but one has only to go as far as Matheson to fully understand what havoc and what devastation the continued burning over of the land really means. When we see settlers there who actually have to buy fence posts from afar, not to speak of building material generally, who have to buy, in some instances, even this winter's fuel, who have to start in at once to manure their land if they want to get any crop at all next year, then we wonder, even making all due allowances for that ambiguous "if," where the added value to the land comes in.—Cochrane "Claybelt," Aug. 25, 1916.

Fire Situation on the Railway Lines

By Clyde Leavitt,
Chief Fire Inspector, Board of Railway Commissioners.

The experience of the present season has proved conclusively that, with very few exceptions, the Dominion chartered railways of Canada have faithfully observed the requirements relative to fire protection imposed upon them by the Board of Railway Commissioners. The proof of this lies in the fact that, notwithstanding the exceptionally dry season, practically no forest fires of any serious consequence have occurred which could be attributed to railway agencies. It is true that a good many fires have started, many of them resulting unavoidably from the operation of trains, but the records show that, in general, the railway employees have been prompt in discovering, reporting and extinguishing these fires before they had time to cause serious damage.

Especial care has been taken by the companies in keeping the fire-protective appliances of engines in good order, and a large amount of work has been done in disposing of inflammable debris on rights of way. Special patrols have been maintained in forest sections, supplemented on all lines by the observance of special instructions to all regular employees relative to the reporting and

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extinguishing of fires in the vicinity of the track.

Not only have the railways been remarkably efficient in handling their own fires, but they have extinguished or aided in extinguishing many fires that originated at a distance from the track, due to all sorts of outside agencies. They have co-operated, wherever possible, with governmental or private fire-protective agencies, with beneficial results which, a few years ago, might have been thought impossible.

Reports indicate that, in many sections, settlers' clearing fires are the most serious source of fire danger. The experience of this year indicates the extreme importance of controlling this hazard, through the strict enforcement of existing legislation in Quebec, New Brunswick, Nova Scotia and British Columbia, and the enactment and enforcement of similar legislation in Ontario.

Society's Debt To the Settler.

"Catholic Register," Aug. 10, 1916: It is a sad lack of organization in the pioneer life of our outlying district that exposes such numbers of people to loss and suffering and death.

The appalling result shows how urgent is the need of establishing and rigidly enforcing the very strictest laws on the subject of bush fires.

Community Interests.

Dundas "Star," July 27, 1916: The interests of the community are of more importance than those of the individual, and we must legislate accordingly.

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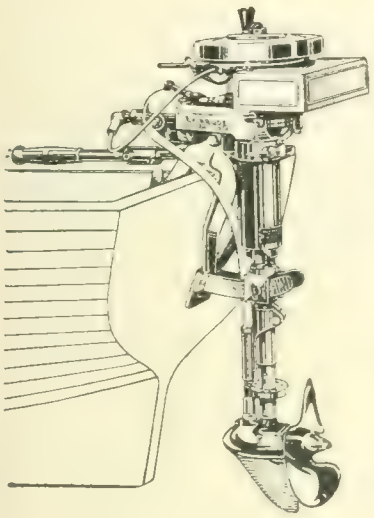

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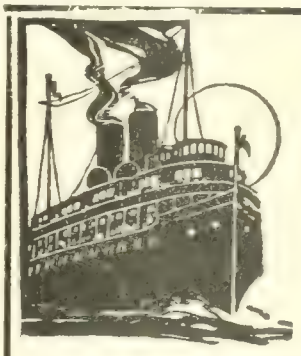
Forest Fires May Make Pulpwood Dearer

(From "Paper," New York.)

Watertown, N.Y., Aug. 29.—The destructive forest fires that have been raging in the pulpwood tracts of the forest of the Provinces of Quebec and Ontario during the past several weeks may prove a f.actor in forcing up the price of pulpwood this fall. The cutting for this year was unusually small, being several thousand cords less than that of a year ago, and this, coupled by a loss by fire, will probaly make a material difference in the price it is said.

E. W. Elsworth, the controlling factor of the Summerville-Elsworth Company, which deals in Canadian wood purchased in the lower part of Quebec, is of the opinon that the price of wood will be much higher this fall than it now is. Where peeled wood is now bringing $13.50 he is of the opinion that it will go to at least $15, and rossed wood that is now selling for $15 he believes will go close to the $17 mark.



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A Boy's Plucky Act.

The following letter is commended to the attention of every reader of the Journal. It was written at Danford Lake, Quebec, by Arnold Heeney, 14 years of age, to his father, Rev. W. B. Heeney, Rector of St. Luke's Church, Winnipeg, and testifies to a genuine conservationist spirit in the lad, as well as to his courage and unselfishness.

After telling his father of the excessively dry weather, the boy proceeds:

"You almost lost your Holmes' place by fire. Uncle Percy went to Ottawa yesterday, and as he passed the place where the creek used to be, on the way to the station, he noticed smoke coming from the bush away to the right of the hill. He jumped off to investigate, and found fire in an old pine stump quite a way into the bush. He met Uncle Willie Rogan and asked him to see that we hired some men to put it out. As soon as we received the message I tried to get a man to help me, but as I couldn't I had to go by myself, and set out with an axe and a shovel. By the time I reached the fire it had burnt out of the stump about twelve feet, and was catching on the lower bows of the spruce and cedar. The flames were quite high, and the smoke choked me. The first thing I did was to quell the flames, and then I cut down all the trees in the fire area (about 7). As there was no water near, I threw sand on till the fire was extinguished. It took me about two to three hours. I have gone back to look at it several times since, and all danger is past, so don't worry. I was pretty tired when I finished, and was absolutely black."

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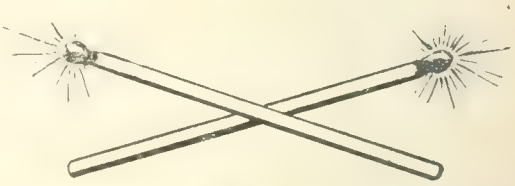

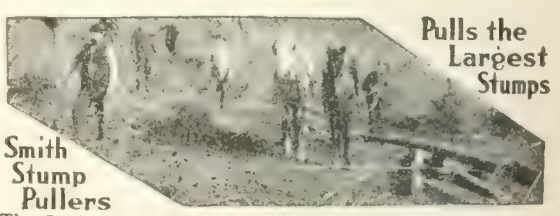

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"To the offices which, in bleak and elevated situations, the pine performs, may be traced much of the beauty and fertility of the earth, and much even of the happiness of man. Standing on the mountain tops, its fringed forests catch and condense the passing clouds, which distill from their branches into the shaded soil, and, percolating moss and grass into the heart of the rocks, flow down by an appointed channel a rejoicing stream into the valleys. When the pine forests on the mountain heights are cut down, the springs and rivulets of the low grounds are exhausted, and the climate is rendered hotter and drier.

The destruction of the grand pine woods that once clothed the Appenines, has rendered the Papal States a region of poverty, disease and wretchedness. In Greece the traveller looks in vain for the old legendary fountains, rivers and lakes, with which the classic poets had made him familiar; the water nymphs have vanished along with their sorrowing sisters the Dryads.

The Picture Abroad.

To put under forest all land not under annual crop is the dream of the conservationist. Even in that land of intensive cultivation, China, there are large areas which, having been denuded of their trees, have been subsequently washed by heavy rains until all the surface that had been enriched by plant life has been eroded and the rolling clay hills are dead land on which the water falling immediately runs off to the rivers, to cause floods in wet seasons far away. Anyone who has travelled through such deforested areas as South Africa and seen its dry kloofs transformed by an hour of rain into dangerous torrents, gets some conception of the extent to which forests act as reservoirs. Is the wilderness of Sinai dry? One traveller tells how he saw a torrent in those bare mountains rise thirty feet in half an hour. The world is full of glaring examples of the devastation caused by de-

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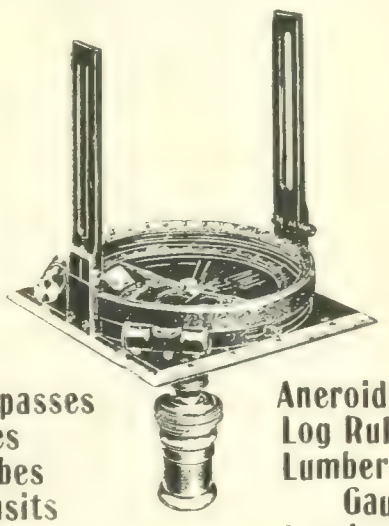

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nudation. One is being forced upon us strongly just now by the campaign in Mesopotamia, once the seat of the world's greatest empires and most teeming millions. Our campaign there has been a moving picture of calamities caused by nature. At one time the tale is of heat and sunstroke, and of long marches to where no water was. At another it is impassable floods. Almost never have there been even tolerable conditions. Yet there is the traditional site of the Garden of Eden. "There the fair tree of knowledge grew." There civilization reached astonishing heights in history's dimmest distances. Or take the Holy Land, which was once the paradise of a people's hopes, the summit of the world in the people's conception. In the days when it was the promised land, full of crowded cities, a man was famous, according as he lifted up his axe upon the thick trees. Who that sees it now can realize what it was? Spain, once the garden of the earth, has relegated much of its surface to wilderness of bald rocks.—Montreal Witness.

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Bird Protection.

New York.—Persons and organizations here who are interested in the protection of migratory and game birds are elated by the ratification of the treaty between Canada and the United States intended to insure the co-operation of the two countries in bird protection.

Wm. Thornday, of the New York Zoological Society, and a campaigning trustee of the Permanent Wild Life Protection Fund, says the treaty is the most important step ever taken to protect birds.

"It means," he said, "that virtually 1,022 species and sub-species of our most interesting American birds will be protected from the Gulf of Mexico to the North Pole.

"It is of prime importance to the farmers, the forest owners, and the fruit growers, since it means that the birds which kill the insects will be conserved."

The Paper Famine.

Many Canadian newspapers received notice this week from American publishers notifying them that there would be no further exchanges sent out. This stopping of all exchanges is part of a plan to save paper. Other publishers are cutting down the size of their papers and effecting various other economies in an effort to save white paper.

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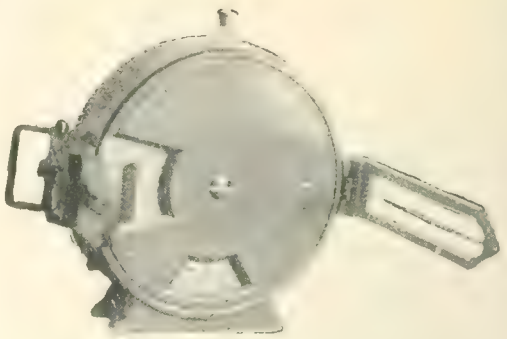

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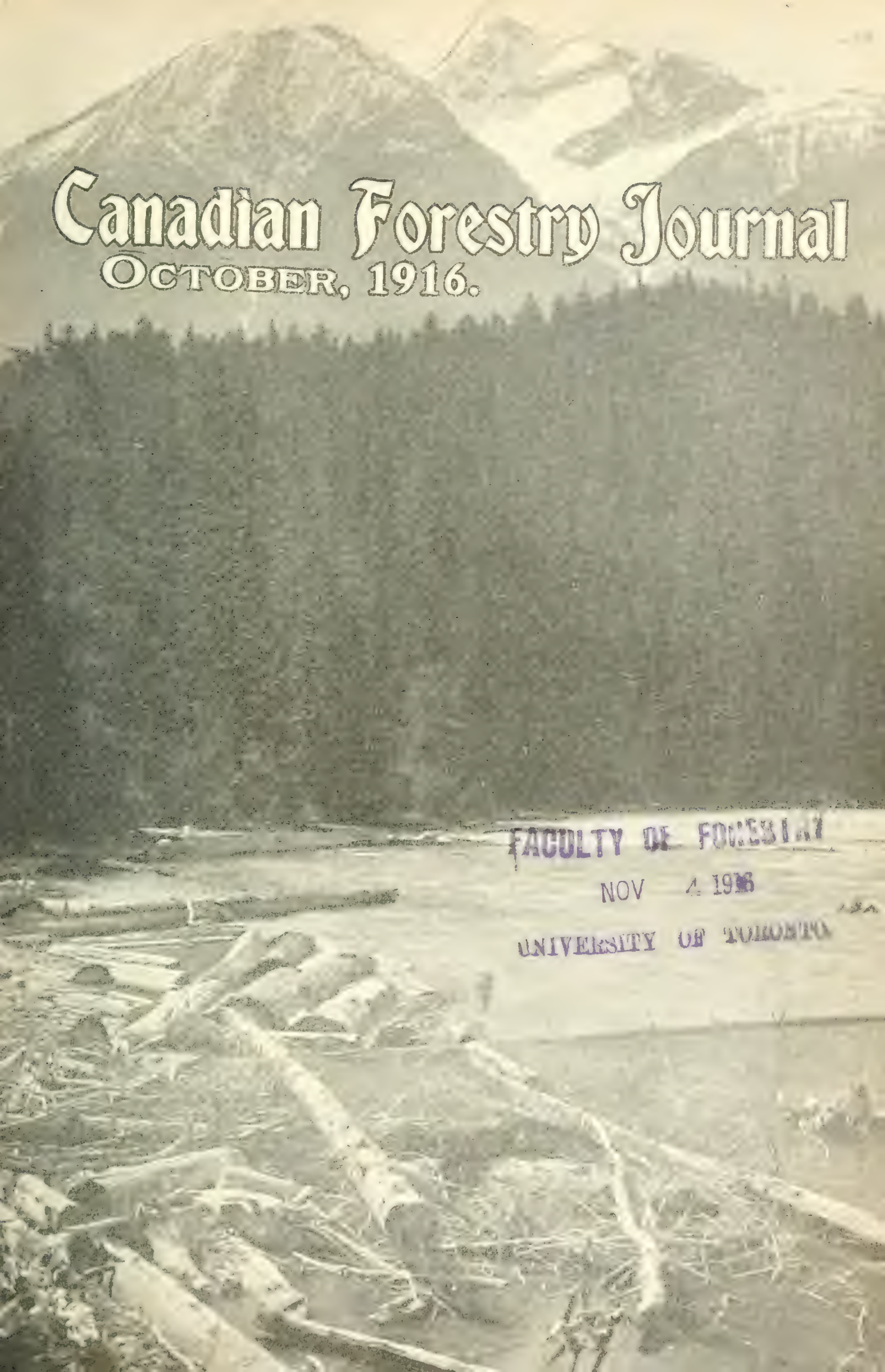

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Canadian Forestry Journal

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The picture gives a very good idea of the common method of clearing farm land in the Claybelt region. The photograph was taken in the Abitibi region of Northern Quebec a few weeks ago. A French settler and three sons have been adding to their cleared area by felling the spruce trees and burning the slash, after securing a permit from a local government official. The spruce roots are shallow in this region, and following a fire a horse and stout chain will easily drag the stump free. The stumps are then piled and set afire.

On a 600 mile inspection trip by gasoline speeder through the forest lands of Northern Quebec. From left to right: Henry Sorgius, Manager St. Maurice Forest Protective Association; Inspector Jensen (kneeling on car); Robson Black, Secretary, Canadian Forestry Association; Ellwood Wilson, President St. Maurice Forest Protective Association. Photograph by Clyde Leavitt, Forester, Commission

Through Northern Quebec On a Motor Speeder

A Description of the Country Traversed by the National Transcontinental and the Fire Guarding Problem

By Robson Black.

..A trip of investigation through the forested regions of Northern Quebec traversed by the National Transcontinental Railway was made during the week of September 18th by the Secretary of the Canadian Forestry Association, in company with Mr. Clyde Leavitt, Forester, Commission of Conservation; Mr. Ellwood Wilson, President, and Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association.

Not only did the journey furnish valuable information as to the character of country, the forest resources and their development, and the settlement policy of the Government, but in addition afforded a first hand acquaintance with the fire protective system maintained by the Province, the railway and the St. Maurice Forest Protective Association in the areas visited. A gasoline speeder carried the party about 300 miles from La Tuque to Amos, the first large agricultural settlement on the edge of the Abitibi country, and in that distance was witnessed the most varied character of topography and soil, from the abrupt hillsides of rock through the Parent-Hervey area, to the fertile clay lands north-west of Nottaway.

Dealing With Fire.

Problems of fire prevention were everywhere recognizable. The railway right-of-way, the operations of the pulp wood jobbers and small sawmills, the great tracts of stripped hillsides and unproductive muskeg, the increase of settlement in the spruce-covered farming sections—each of these factors suggested the need of a resolute and unified policy of protection.

The St. Maurice Forest Protective Association has charge of the railway fire patrol throughout its territory, extending from Parent south-easterly to Hervey. The railway pays one-third of the cost, the balance being divided between the Association and the Provincial Government. The railway recently has given the rangers full co-operation, supplying their speeders with free gasoline and oil, and assisting the work by such means as the officials can control. It was found that the right-of-way, except for sections on the easterly part of the line, has not been cleaned up in harmony with the practice of the Dominion chartered railways, based on instructions of the Railway Board. Over hundreds of miles the fire hazard from profuse growth of grass and weeds is yet to be dealt with. As concerns the effectiveness of the fire protective measures adopted by the Government Railways on the greater part of the right-of-way outside the St. Maurice limits, the instructions to section crews regarding vigilance in fire prevention constitute about all the precaution taken. These instructions are good as far as they go, but experience shows that they have been indifferently observed. A conscientious foreman may carry out orders to the letter, but the average crew are more apt to treat incipient fire with the same sort of carelessness that characterized railway gangs in the construction days.

Using Section Crews.

Far better results would be obtained if the railway placed a few skilled

inspectors on speeders to patrol the country east and west of the St. Maurice territory, giving them enough authority over section gangs to use them in emergencies. With such a patrol, the province would be given as good protection as is now secured on the St. Maurice Association's section, where in four years there has not been a single bad fire; the country is a mass of green, and valuable young growth is everywhere in evidence. This happy condition cannot be said to apply to the country bordering the right-of-way where patrol has been lacking. While on the eastern end of the line visited by the writer, the timber damage has been less, the western section shows in many places the effects of violent fires during the past three years. For twenty miles west of Parent, the country is completely burned and for miles back from the track. This year witnessed many fires, with some severe destruction.

The result of all this forest damage may not be apparent to one unacquainted with the route taken by the railway. From La Tuque to Nottaway, 250 miles, the country is absolutely unfit for settlement. Only here and there in a pocket is a piece of farm land visible. It is claimed that no mineral wealth has yet been discovered. Therefore, the only possible source of local freight traffic for the Government railways are the forest industries. If the lumber and pulpwood are cleaned out at the rate permitted for years past, the La Toque-Nottaway section will be absolutely barren, incapable of producing a ton of goods or a passenger.

The record of freedom from fires established on the St. Maurice Association's section by careful patrol and vigorous control of all outbreaks shames the policy applied to the balance of the line through forested Quebec. It is not too much to expect that General Manager Gutelius and his staff will extend the system which they have endorsed and aided on the St. Maurice Association's territory to cover the entire right-of-way exposed to an equal hazard.

A suggestion of similar character addressed to the Provincial Government is not unreasonable. The country from Quebec to the Ontario boundary, following the line of the Transcontinental, divides itself roughly as follows:

From Quebec to Hervey Junction: fair farming land.

From Hervey to Parent: rocky, becoming mountainous. Black spruce and hardwoods, with some balsam in the lower lands. Non-agricultural, with minor exceptions at the Hervey end. Pretty well lumbered. Protected by the St. Maurice Association.

From Parent to Nottaway: Jack pine and white birch. A great deal of muskeg. Impossible for farming at present.

From Nottaway to the Ontario boundary: Good farm land, increasing in fertility from Amos westward. Settlement growing rapidly. Crop results said to be satisfactory. Large pulp wood production from settlers' lands, which may find a profitable market.

Curbing the Settler.

A thorough railway patrol is needed from La Toque to Nottaway, and this is already accomplished on part of the line by the St. Maurice system. On the balance additional measures are necessary. From Nottaway to the Ontario boundary brings the problem of supervision of settlers, and this is a function of the Provincial Government. At present the bulk of fire prevention is left to local officials called "settlers' guides," who are visited from time to time by provincial inspectors. These "guides" issue permits for clearing fires, and instruct the settler in the necessary precautions. The wide territory which some of them are supposed to cover, and the fact that some are occupied mainly with store-keeping or other employment, makes it difficult to give thorough attention to the settlers' fire problems. Nottaway, for instance, barely managed to save its cluster of houses from the fires of July and August. Indeed, the destruction of property on the Quebec side of the Abitibi country was needlessly high, despite

the tendency of local residents to point to the terrible contrast in the Ontario Claybelt. It would seem, therefore, that the fire hazard in the Quebec Abitibi district deserves a more adequate offset in rangers giving their exclusive attention to the one job. The means of fire patrol at present do not approximate the minimum requirements of safety.

Fire supervision in lands bearing a poor tree growth sometimes impresses onlookers as superfluous, unless settlers' lives and property are likely to be in danger. The other side to this objection is that in many parts of the country along the Transcontinental the poor growth in the unpopulated muskegs beside the track leads a few miles back into large-sized timber. While the destruction of the muskeg spruce may be of little account in itself, the fire will pass eventually into the timber adjoining. The point is illustrated by a town fire brigade which recognizes any fire, whether in a shack of a skyscraper, as a serious peril to public property, and takes as prompt precautions in one case as in the other. Whether in Quebec or any province, patchwork in forest protection is a waste of money. Where roads are few and far between and only the waterways intervene, the same fuse of destruction leads through all forest growth. Touch it off at any point and who will prophesy the consequences?

Real Ranging.

The trip disclosed not only the inequalities of forest protection outside the well-organized patrol district of the St. Maurice Association, (in which the Provincial Government is a most helpful partner), but some of the reasons why that Association has built up its record of immunity from timber loss. The valuable weapon of the settlers' permit laws has been applied in a thorough but tactful manner by all the rangers. In 1916, only one damaging fire was set by human hands. Manager Sorgius and his men have accomplished their results in fire prevention and fire quelling by the very antithesis of such time-serving, job-holding practices as usually find their highest expression in the political patronage plan of fire ranging. The men are engaged on the basis of experience, energy, and intelligence. They are closely inspected. A "camaraderie" is encouraged by providing such comfortable quarters and equipment as the visiting party saw in the cabin at Manouan. There is no imaginable barrier to the duplication of these effective methods in every provincial and federal forest system in Canada,—no barrier at least that will bear public examination or a government's frank discussion.

A trip on a speeder for a total of about six hundred miles is in itself a spicy experience. Rain and cold winds were frequently encountered, but interfered little with the running time or the grim delight of holding fast to a self-propelled packing-case. Tripping along at thirty miles an hour in the pitch dark, seated a few inches above the roadbed, with rain and lightning occasionally putting the joy into life,, was equalled only by a night spent in a freight car from Parent to Doucet, with a bale of hay for a mattress and a lamplight breakfast at four o'clock.

Observations Abroad.

Mr. Roy Campbell, secretary of the Canadian Pulp and Paper Association, Montreal, returned recently from Europe, where he had been engaged as secretary of the special trade commission appointed by the Dominion Government. Mr. Campbell has some interesting observations of the French forestry methods as carried out in the mountainous region inland from Bordeaux and Limoges, a sandy mountainous country with patches of well-managed forest of from one hundred to a thousand acres. Everything in this region was cut from five inches upwards, largely for military purposes. The litter was carefully cleared up and branch material bundled for fuel. Some of the oak floors in French homes were a couple of hundred years old, and still possessed their original beauty. In England, Mr. Campbell made note of the railway ties, which were creosoted and larger in dimensions than Canadian ties.

Nipigon Forest Reserve—Ontario's Oasis of Real Protection

Chief Officer L. E. Bliss and His Men Build Up a Fine Record in Thorough Forest Guarding

The Canadian Forestry Journal has maintained more than once that if the general forest protection work in Ontario were patterned on the achievements of Mr. L. E. Bliss in the Nipigon Forest Reserve, the necessity of a reform agitation would be vastly reduced.

The Nipigon Reserve's scheme of fire prevention forms a happy oasis in the centre of Ontario's ill-conceived and ill-administered forest protection service. The reason reflects some credit on the Department of Lands and Forests in that they have left the chief officer, Mr. Bliss, free to adopt improvements and manage affairs as his own intelligence suggested. Beyond any doubt, the whole province could be raised to an equal level by appointing a "Chief of the Forest Protection Service" and giving him a free hand to operate his machine.

Only in the forest reserves has the Ontario Government encouraged improvement work, such as building trails and telephone lines. In the vast reaches of forest constituting the main portion of the provincial timber, no such essentials to fire guarding have been provided. It will be noted that Mr. Bliss has taken unusual latitude in two other matters, the control of settlers' fires, and the appointment of his own rangers. The reader will no doubt recognize once more the link between conscientious management of rangers and good results in timber saving.

The rangers in the Forest Reserve are under Mr. Bliss' immediate supervision. There are 125 miles of bush telephone line, with some 12 or 14 telephones attached. These telephones are all in the rangers' cabins. In Nipigon, at the end of the telephone line, is an office assistant whose sole duty is to attend to the calls of the telephone. Every morning at 7 o'clock every ranger is called by telephone. They then leave for their patrol work. At the end of their patrol they again report, about noon, to the office, again at 6 p.m. on their return to their own cabins. On all the canoe patrols, the rangers carry fire pails, shovels, mattocks and axes in their canoes, so that should a fire be discovered they will have something to fight with.

Towers and Their Use.

In the Reserve are four lookout towers, all placed on high vantage points. These lookouts report to the office every hour, and oftener, of course, if smoke is discovered. They are supplied with powerful glasses so that it is possible for them to cover an immense area. In Nipigon a motor car is provided, and on Lake Nipigon a powerful motor boat. As soon as the lookouts report smoke, men are loaded on the car and taken to the fire at 30 miles per hour, and if by boat at the rate of 10 miles per hour, so that whatever means of locomotion is necessary it is not long before they are at the fire. Every fire that occurred in the reserve this season was first reported to the office by the lookouts. They are, as it were, the eyes of the system, and when they see and report smoke, it is up to the men to put it out, as the lookouts have done their share. A lorry is kept in the car house, on which are piled blankets, tents, cooking utensils, etc., so that when extra men are being taken to a fire this lorry is attached to the motor car, and as it is always ready, not a minute is lost. In

A hundred and twenty-four years old, and still occupied, is indeed a unique record for a Canadian log house. This substantial pioneer house was built at Unionville, Ontario, by Philipp Eckhardt, a progenitor of A. J. H. Eckhardt, a well-known citizen of Toronto, and a life member of the Canadian Forestry Association. It is said to be the oldest log house of similar dimensions in the Dominion. Some of the logs are 30 to 36 inches in diameter, and show few signs of disintegration. The builder, Mr. Philipp Eckhardt, constructed the first saw mills and grist mills in Ontario, 1792, about three miles west of Unionville. It is interesting to note, as a testimony to the comfort of this log home, that its occupants, numbering thirteen, took first prize at a 1912 political picnic as the "heaviest family attending the event."

the Nipigon office there is a list showing all supplies necessary for men at this work, and the amout required per man, so that as soon as fire is reported this list is taken for a guide, and the supplies ordered accordingly. The whole aim is to be ready for action as soon as the lookouts call in. These lookouts have now been working for the past three seasons.

Settlers' Fires.

In Nipigon Township, where there are a lot of settlers just south of the reserve line, Mr. Bliss does not permit any burning whatever from May 1 to Sept. 15. This is a matter of personal arrangement, and not of law.

Mr. Bliss is also in charge of fire protection on the Transcontinental for a distance of 250 miles. On this area was placed a force of eight rangers under an Assistant Chief Ranger, and all were supplied with speeders, with a daily run of 30 miles. At the end of each patrol are comfortable tents, so that two rangers always camped together.

The speeders carried more than enough equipment for one ranger, so that should a fire be discovered requiring more help, the ranger would be able to furnish the necessary tools. The Assistant Chief in charge of these rangers left with them in the spring and returned with them in the fall, and was continually going along from one gang to another, and in that manner the best results possible were obtained. In 1916, one of the driest seasons on record, no fires left the right-of-way. The rangers on this staff purchase their

supplies in pairs, and have a main, or headquarter, tent, but the partners are only together at their main tent every other night.

Selection of Men.

The men on the staff, as well as the men on the other two staffs under Mr. Bliss' supervision, are selected by him from amongst the guides,, trappers, prospectors and lumberjacks. They have the vim necessary for their work, and being experienced bushmen, are quick in an emergency, and resourceful. Knowing the country, should extra help be required, they know exactly where to turn. The majority of these men have been on the same staff for the past six or eight seasons, and are veterans in fire fighting. ,

Kawkash Mining Division.

In the area are 16 rangers, under an Assistant Chief Ranger, and all are good bush and canoe men. They patrol carefully along the canoe routes used by the prospectors, while others patrol on land over the area that is being prospected. Part of the prospecting, especially around Tashota, was conducted right up to the right-of-way, so that in that part were placed extra patrols on the railway. The rangers in this section did excellent work, as the total acreage burned in this part was only about 800 acres of scrubby spruce.

Mr. Roland D. Craig, who with Dr. H. N. Whitford, have spent several years compiling a report on the forest resources of British Columbia for the Commission of Conservation, have left the province, Mr. Craig returning to Ottawa to complete his report, and Dr. Whitford taking a professorial chair in the Forest School at Yale.

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Please send in names and addresses without delay.

More Reading Matter in the Journal

By an alteration in this issue of the Canadian Forestry Journal, the columns have been widened and lengthened, thereby increasing the amount of reading matter.

The enormous advances in the prices of paper, coupled with a rising scale of wages, have added an unanticipated extra burden to the publishing of the Journal. The paper stock alone has almost doubled in price, and nearly everything entering into the composition of a piece of printed matter is taking the usual upward journey.

The Journal's advertising revenue covers but a small part of the annual cost, the balance being met from the general revenues of the Association.

Pulp Imported From Canada.

Of the billion pounds of pulp imported by the United States for the fiscal year ending June 30, 1916, over two-thirds came from Canada. The pulp importations for 1915-1916 have been 189 million pounds less than for the previous 12 months, yet the amount shipped to us from Canada during the past year was 130 million pounds in excess of her 1914-1915 shipments.

During the year just closed nearly 70 per cent. of our 1,135,000,000 pounds of pulp came from this country, while most of the remaining 30 per cent. came from Norway and Sweden.—U.S. Report.

Fire-proofing Shingles.

A statement is made that a cheap process of fire-proofing shingles has been discovered by an Iowa druggist. Tests made at the University of Iowa show that a block of wood one-half inch thcik was saturated with the fire-proofing and then placed in running water for twenty-four hours. After that it was thoroughly dried again and held for one hour over a Bunsen burner, which had a temperature of between 700 and 1,000 degrees Fahrenheit, that being a much greater heat, it is said, than is developed in a conflagration. The wood was not burned, and only charred very slightly at the point of the flame.

Better Forest Protection for N. B.

The New Brunswick Government is preparing plans for the reorganization of the whole forest protection system. That the provincial forest possessions of over 18,000 square miles merit the most modern and effective safeguards against fire goes without saying. The notion that forests can be left to take care of themselves has been abandoned by nearly every government on earth having authority over timber lands. Once the responsibility for forest protection is admitted, it behooves a government to build up the most economical and up-to-date patrol service. The maintenance of New Brunswick's forest industries depends absolutely upon the elimination of destructive fires. In 1912, before the slump in the lumber trade was under way, New Brunswick produced nearly $7,500,000 of lumber, shingles, pulp wood and lath, not counting fire wood, fence posts, etc. The New Brunswick Government receives an average of about $500,000 a year from forest operations and thousands of workmen owe their living to the same source. A very substantial part of the business of our merchants and manufacturers is accounted for by the annual wood harvest.

To those who wonder if New Brunswick can be freed from serious forest fires, it may be pointed out that a private association of Quebec Province, the St. Maurice Forest Protective Association, patrolling two-thirds as much territory as the whole forest area of New Brunswick, have reduced forest fires to an extent hitherto regarded as impossible. This was accomplished by good organization, close inspection of rangers, and authority to regulate the clearing fires of settlers. New Brunswick has done much already in the way of forest protection, and can enjoy similar immunity by taking similar measures. Lacking them, no Government can hope to preserve invaluable timber assets against the ravages of fire.

Another Side to "More Production"

The repeated cries for "more production" in order to enhance the wealth of Canada are apt to cloud the fact that prevention of waste by Governments themselves is the most direct and obvious means of filling the country's purse.

When one knows that the Governments issuing the admonition are themselves fully empowered to eliminate waste in such assets as agricultural and forest lands, the proposition to fill a leaky pail loses some of its reasonableness.

Ontario's forest fires this year represented a straight loss of 3 to 5 million dollars in the Claybelt alone, counting only the immediate property damage. The fires in Quebec certainly will show a substantial financial injury. Were all the provinces and the federal government to add their forest fire debits, after a complete and frank survey of destroyed areas, the result would illustrate the awkwardness of trying to make an extra million out of wheat and at the same time tossing away its equivalent in preventible forest fires.

The growing forests represent the easiest money Canada ever will lay her hands on. No less than seven and a half millions a year are paid into provincial and federal treasuries each year from timber operations. Five thousand industries look to living forests for their supplies. Our mines, fisheries, agriculture, are helpless without the co-operation of a cheap wood supply. When we abandon the guardianship of this precious pillar of our prosperity to the fire fiend himself, we betray the interests of present and future.

B. C. Rangers Review Their Problems

(From Vancouver "Province.")

New Westminster, Sept. 30.—Dominion fire rangers of the New Westminster district met yesterday afternoon in the Columbian block in this city to review the work of the past season, and lay plans for better protection from bush fires for British Columbia timber. Crown Timber Agent E. W. Beckett, who presided, initiated these meetings of the rangers, one being held just prior to the men going to their duties in the spring, and the other when they return in the autumn. The interchange of ideas has proved most beneficial.

Reeve Lougheed of Maple Ridge, who has long ben closely interested in the timber question in this province, in addressing yesterday's meeting, pointed out the urgent need for reforestation in British Columbia. Accessible timber is rapidly being used up, and if something is not done now there will be little doing in the timber business in this province in another fifteen years. He favored experimenting with eastern hardwoods in burned areas as being more practicable than waiting for the slow-growing native fir and cedar. Some of the eastern varieties, he thought, would do well here, and should produce timber of a merchantable size, twelve to sixteen inches in diameter, within ten to fifteen years. He himself, and he believed, other lumbermen would be willing to put up a little more money than they are now assessed if the government would do some experimenting along these lines.

Mr. D. Roy Cameron, district inspector of forest reserves, when dealing with the same subject, predicted that forest reserves would be created, and that in time extensive experiments in reforestation would be carried on.

The meeting was held primarily for the discussion of methods of fighting forest fires. A resolution was passed by the meeting asking for an amendment to the Provincial Bush Act, providing once more for the necessity of obtaining a permit for setting a fire prior to October 1. For the past two years no permit has been necessary after September 15. The speakers all emphasized the necessity of burning the slashings following the construction of railway rights-of-way, roads and settlers' clearings ,so as to prevent the spread of bush fires. That pumps be supplied to water patrols, and the need of more look-out stations were some of the suggestions made. The look-out station established this year on Mount Cheam, near Chilliwack, proved a great success, and gave command of a wide area of timber. From that station on clear days one can see right out to the Gulf of Georgia.

Guides for Excursion Parties.

"I would like to se a law enacted compelling, fishing parties always to have a guide accompany them on their excursions and make them pay the expenses of the guide, and I would have wardens appointed to follow small excursion parties into the well-known fishing grounds, and I would make it penal for any one to throw their cigarette or cigar butts or the heel of their pies into the bushes or dry leaves.

"If this course were followed, it would put sportsmen on their guard, and prevent a large number of fires which do such serious damage.

"If possible a fire in the woods should be built on the shore of a river or stream, otherwise a rock fire place should be put up to build a fire on, and white birch should be used, if obtainable, for fuel, as it will not spark and does not produce coals to any amount to retain the fire."—Henry B. Rainsford, Fredericton, N.B.

The Cover Picture.

This month's cover picture shows Gates Lake ,in the Lillooet District of British Columbia, Pacific and Great Eastern Railway.

(Courtesy of "Forest Leaves.")

A small plantation made by French peasants in a clearing. Dead branches were stuck into the earth for shading purposes.

With the Canadian Wood Cutters in France

Describing the Detailed Care of French Foresters to Secure Forest Regeneration and Prevent Fire

Written by
Captain Frederic C. Curry, Brockville, Can.
Late 2nd Army Wood Cutters

During the months of April and May of this year the writer was attached to the engineers as officer in charge of a party of soldiers engaged in cutting timber for the trenches in one of the French National Forests in rear of the firing line.

Here he had an opportunity of seeing some of the steps taken by our Gallic Allies toward preserving one of the most valuable of their national assets. Forestry was not a subject that the writer had ever given much consideration to, but the striking difference between the care taken by the French and our criminal carelessness in this respect, especially in Northern Ontario, was enough to impress the most indifferent of citizens.

The forest itself consisted of about

seven square miles, and was divided into six "series," each series being further subdivided into thirty "coupes," the trees in each coupe being of about the same age.

A macadamized road traversed the forest from end to end and from the centre, where the chief forester's hut was situated, well made and drained earth roads ran in stellar fashion through each series.

No Lookout Towers Needed.

The coupes were similarly marked off by boundary stones and a cleared path about six feet wide, often with a bricked centre to give a secure foothold to horse traffic. There were no watch towers or fire guards, a fact that I commented on, and was assured by the old forester were unnecessary.

Each series was under the charge of a separate forester who also acted as gamekeeper in those series in which game was permitted to live. Pheasants were plentiful in every series; rabbits, or rather hares, were only tolerated in the alternate ones, which were carefully fenced with a rabbit-proof netting and gates, a stiff penalty being awarded for leaving the gate open. A small variety of deer was also plentiful, but the writer did not see any at close enough range to identify. They were not much larger than a goat and about the same color as our own deer. One only saw them as a patch moving across the avenues of the trees in the distance.

Engineers at Work.

Our work in the forest consisted of felling small trees, mostly oaks and ashes, up to nine inches across the butt, for use in the trenches as dugout props, etc. Smaller stakes were also cut for use in wire entanglements and in revetting the sandbag walls of the trench. The majority of the actual felling had been done before the writer's arrival, and when he took over command we were merely getting out the logs from some of the inner coupes where work had been stalled by the mud and cleaning up the brushwood and stumps from the other coupes.

Logs were handled on sledges we built for the purpose and skidded quite nicely through the mud, unusually large ones being hauled singly, butt first.

Road Building.

The brushwood was first thrown into piles and then on the coupe being cleared of logs it was bundled according to its nature into "fascines," or "firewood." The former were bundles ten or twelve feet in length and as many inches in diameter, made by laying the branches alternately "butt and brush," and bound here and there after "choking" with withes or iron wire. Thye were largely used in road building across swampy ground, and if you ever wish to punish infantry just march them a few miles across a road made of this material. At Valcartier we experienced one road of this sort, through which the horses sank to their flanks when the fascines, which had not been properly tied, started to spread.

They are, of course, only used for temporary roads, filling in shell holes, etc., but in France were employed to form a cushioning layer several feet below the stones of the paved roads.

Brushwood that was too short for fascines was trimmed of its finer branches and cut into four-foot lengths, which were also bundled and ultimately went to the trenches in the form of charcoal.

Even Spread the Ashes

Anything left after the firewood was cleared was burnt and the ashes then had to be spread over a considerable area so that the rain would carry the potash contained in them back into the soil. There is little waste in France.

Even the chips made in felling the trees were not wasted, being gathered up in bags by old women and children who scoured the coupes as soon as they were vacated by the soldiers.

The stumps, too, had to be cut level with the ground, not the easiest method of felling a tree, but saving in the course of a few years many thousand feet of timber.

Branding the Trees.

There is another reason for cutting the stump so close, and that is for the purpose of replanting, the French trusting to the sprouts the stump is bound to send up the following spring to fulfil this important work. Fed by

the huge stump roots, trees we had felled only in March had shoots three and four feet in height by the end of April. The healthiest of these shoots would be banked around with a little earth later by the forester, and the remaining shoots trimmed away and gradually the new tree would replace the old. It seemed an ideal system.

When the trees reach a diameter of six or seven inches they are branded with the year the former tree was felled and with a number which is entered on the forest registry, and the history of the new tree begins. It ends when the standing timber is sold and the tree marked with a large "X" scored in the trunk by the forester and the purchaser, whether, as in our case, the British Government or a private individual, fells the tree, cuts the stump level with the ground again, and leaves nature to do the rest.

Quite different is our system of swinging the axe waist high and leaving behind us a mass of stumps surrounded by piles of brush-wood waiting only for the match of a careless smoker to complete the devastation that we have begun.

Think of the saving for Canada if every man cutting a tree could be made to level the stump and protect the young tree during the first few years of its growth.

In France every roadway is outlined with beautiful trees, not for picturesque effect, though the result is artistic in the extreme, but because the roads are the nation's, and the nation knows the value of its standing timber.

We on the other hand seem to fail to realize the value of ours.

FREDERIC C. CURRY, Capt.
Late 2nd Army Wood Cutters.
Brockville, Canada.

The fall meeting of the technical section of the Canadian Pulp and Paper Association will be held in Montreal on November 15 and 16. There will be a paper and discussion on the forestry end of pulp wood production.

Sixty-eight members of the B. C. Forest Branch have enlisted, in addition to 47 forest guards. Messrs. Mitchell and Rees have won the Military Cross.

Ranger Reaches Tree Top With Spiral Ladder.

On the summit of Brush Mountain in the Crater National Forest of southern Oregon, the top of a tall fir tree is used as a lookout station by a ranger who patrols the woods and is on a constant vigil for fires. In establishing his observatory, the man constructed a spiral ladder which winds about the trunk and extends to the uppermost part of the great tree. He did the work unassisted, and in a staunch and durable manner . The rungs of the ladder consist of heavy yew pegs driven into 2-in. auger holes, spaced at regular intervals and bored 1 ft. deep into the tree. After these members had been put in place, their outer ends were connected and reinforced by a log railing, made of partly sawed Douglas fir poles.

Any Member of the C. F. A.

Can have the Canadian Forestry Journal sent free for three months to any person regarded as a prospective new member.

Please send in names and addresses without delay.

How Minnesota Disposes of Logging Debris

Winter Slash Burning is Imposed on All Operations, Whether Lumbering, or Road Building

Note: The Editor of the Journal recently asked the State Forester of Minnesota to outline the methods of slash disposal as practised in that state. His reply follows:

The laws of Minnesota require that logging slash and slash from the rights-of-way of roads and ditches shall be disposed of in accordance with the direction of the forester. Our practice in handling slash from rights-of-way of all kinds has been to have it piled and burned in the centre of the right-of-way at the time of cutting; while for logging operations the practice varies with the character of timber and land involved. In the operations in thick stands of Norway and white pine we are bringing about the practice of burning as cutting proceeds. Where spruce is logged clean, the brush is piled in windrows and burned as soon as the snow is off the ground. Operations by steam skidders on marketable agricultural land permit clean burning as soon as the cutting on each unit is completed. On the rocky non-agricultural lands, where heretofore we have not found it feasible to require winter burning, the slash is cleaned up on strips from one to two hundred feet wide adjoining the logging roads and spurs. Our purpose is then to keep all fires out of the remaining slash.

Before logging operations start in the fall, our rangers ascertain what areas within their districts are likely to be cut, and, after an examination of the lands, a notice is issued to the logger, directing him as to what method he shall follow in disposing of the slash on each and all of the descriptions to be logged over. **We have found that the opposition to winter slash burning has decreased as the loggers have become more familiar with doing the work, and as they understand more of the dangers and damages that result from a postponement of the operations until spring or summer.** At this time we are considering the advisability of asking the legislature to declare a closed season for brush disposal, it being understood that such work could be carried on during the closed season only under special permit from the district forest ranger or the state forester. Although burning may be done satisfactorily early in the spring before the frost is out of the ground, the results on the whole have not been a success. The period during which it is dry enough to burn and not too dry for safety is so short and uncertain that a crew might be held in readiness for weeks awaiting the time to burn. On the other hand, one or two men may slip into the woods and set fire to the slash area when it is dangerously dry. The latter action has in many instances destroyed company property and private property ten times more valuable than what it would have cost to burn the slash in the winter time.

DILLON P. TIERNEY,
Acting State Forester.

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Resources of the Upper Ottawa

By R. O. Sweezey

This is neither the "boost" of a "spurious optimist" nor the wail of a morbid pessimist (both of which classes we are more or less afflicted with), but is a plain, unvarnished statement of a few facts taken from the writer's field note book.

Great as are the better known resources, in timber and water powers, of the Lower Ottawa region, comprised within the area drained below Lake Temiskaming, they do not excell the 10,000 square miles of undeveloped country in the Upper Ottawa region, extending from Lake Temiskaming to the Grand Lake Victorian Basin.

Whilst the Lower Ottawa has for generations been pouring out its wealth of pine timber to the world's markets the Upper Ottawa has remained untouched because spruce and not white pine has always been the predominant forest there. To-day there remains very little white pine in the Lower Ottawa, or indeed anywhere in Canada. Spruce there remains in abundance, but in localities where pine has been so plentiful, as in the Lower Ottawa, the spruce is naturally not growing in such pure luxurious stands as in the regions where pine has never predominated.

Rich Virgin Spruce.

Thus we find to-day the Upper Ottawa Valley, which was never much of a pine country, a rich virgin spruce forest abounding in water powers, great and small, and ready to offer up its resources at a time when the pulp and paper industry is preparing to take a world lead in Canada.

To anyone who has not cruised inland from the rivers of the Upper Ottawa the wealth of spruce is unbelievable. Casual observers of the morbid pessimist class have been known here as elsewhere to cry calamitously, like the car window observer, because the whole timber wealth of the region did not roll out to the river banks for in-

(Courtesy Grand Trunk Railway System.)

ON THE MAGANETAWAN RIVER, ONTARIO.

spection. If the natural resources experts want to see timber, and especially spruce, it is necessary to leave the car window or canoe and get inland, usually a quarter of a mile at least, for the spring floods which overflow the banks of rivers and lakes prevent the maturing of large spruce in any quantity along shore. Besides winds contribute towards restraining a heavy growth to the water's edge. And along railroads the laxity of control in burning right-of-way cuttings, has often been responsible for long strips of burn both sides of the track. Once inland beyond the influence of these agencies the density of growth in the north country becomes evident.

In the Upper Ottawa I have found black spruce in thick growth, in areas of over a hundred square miles, which, when followed in their more or less irregular outlines, will average 10 to 15 cords per acre. Some sections of 10 to 25 square miles will yield 20 cords per acre and many localities of 100 to 600 acres contain 30 cords per acre. Actual measurements have been made showing 45 to 52 cords per acre on small sections, the number of black spruce trees of 7 inches upwards on such sections being as high as 520 to the acre.

Good Navigation.

The operating facilities of this whole region are particularly attractive owing to the possibilities of steamboat navigation in stretches of 50 to 75 miles on lakes and rivers. The whole region of some ten thousand square miles can be reached with comparative ease, and that active operations may soon be looked for in this section is quite probable considering that some thirty million cords of spruce, exclusive of several million cords of poplar, stand ready for the axe.

All this wood may be cut, floated down and delivered, for a cost of $3.50 to $5.00 a cord, at the great water power sites of the Quinze River situated near the Temiskaming and Northern Ontario Railway, and one hundred miles nearer markets than pulp and paper mills now operating with eminent success.

In a distance of fifteen miles from Quinze Lake to Lake Temiskaming the Ottawa (or Quinze) River can develop powers aggregating 250,000 up. Besides this several other water powers farther up the main Ottawa can develop 5,000 to 20,000 horse-power each.

Preached Sermon on Fires.

On Sunday, Sept. 8th, the Rev. R. A. Robinson, rector of the Anglican Church, Monteith, and who is in the south undergoing treatment by a specialist for eye-strain, visited the city of St. Thomas, and at the evening service in Trinity Anglican Church spoke on the "Causes, Experiences and Consequences of the Recent Bush Fires in New Ontario."

The St. Thomas Journal has the following report:—

"Speaking of the fire and its cause he said it was not accidental, and while some thought campers were careless with their fires and others blamed the smokers who threw aside cigar stubs, the fact remained that this disaster was caused by the settlers deliberately setting fire to the woods to clear the land, and the usual dry spell of July developed a perfect cyclone of fire beyond all control. The men of the township were called out to fight the flames and in the township of Monteith they were successful, but Cochrane and other townships suffered severely with a loss of life totalling 450. Gruesome facts were touched on, and settlers' efforts to escape were detailed, as well as the ready response by all for relief.

"This is the sixth bad fire in ten years, and many residents can be met who have been burned out two or three times. This last fire has cost $50,000,000, and unless something is done settlers will leave for the West. What is needed is a good commission to look into the whole question of fire prevention and settlement."

Mr. B. M. Winegar, of the C. P. R. Forest Service, has been adding to his excellent record in fire protection work by undertaking large planting operations on the Eastern lines for snow protection purposes. Next spring the planting work will be greatly extended.

Reforesting for Returned Soldiers

From the Edinburgh Scotsman.

Mr. Tennant had the pleasant task of announcing in Parliament on Wednesday night what he rightly described as a "most patriotic and munificent" action on the part of a great Scottish land-owner.

The Duke of Sutherland, with a generosity and public spirit which will everywhere meet with merited recognition—recognition which will be the more hearty because this is not the first benefaction the nation has owed to the Sutherland family—is making a gift of absolute conveyance to the nation and its soldiers and sailors of an estate of 12,000 acres.

The conditions attached to this gift are that the land is to be used for the settlement of soldiers and sailors who have a good record of service, and entered the Service as volunteers, and half of the holdings to be formed will be allotted to sailors.

While the selection of the settlers is to rest with the Secretary for Scotland, it is a reasonable stipulation on the part of the donor, who is naturally interested in making a success of the scheme, that his wishes should be consulted in the first selection.

The settlement is not to be on a purely agricultural basis. Part of the land is to be set apart for reafforestation by the State; and this part of the scheme will provide an object lesson in State forestry and a subsidiary means of employment to the small holders on the land.

The scheme will start under the most fortunate auspices. The land is given free; the settlers will have that combination of employments which is recognized as the ideal, and indeed the only practicable, condition in the case of small holdings; and the financial prospects of well-directed forestry enterprises are at the present time as favourable as their inauguration is necessary in the national interest.

Purchase of Stock.

In the course of his statement Mr. Tennant said: The Duke was prepared to remove the sheep stock from the farm, but it was agreed, upon his (Mr. Tennant's) recommendation, that the sheep stock should remain, and that the State should purchase it. The purchase of the sheep stock, cattle, and horses, together with the furniture and shooting lodge, would be on terms to be mutually settled. The conveyance of the property and the delivery of the stock and equipment was to take place at Martinmas, 1916. The Duke had agreed that the State might make a light railway on the estate. He should like to be allowed to convey to the Duke the warm thanks of the House for his most patriotic and munificent gift.

Prospect of Returns.

The capital expenditure of the first two years for stocking and afforestation would come to about £20,000, including the equipment of twenty holdings, and thereafter about £1,400 a year. After fifteen or sixteen years the returns from the woodland would begin, and, of course, there would be returns from small holders.

From that time onwards there would be a re-payment of the capital invested, which would be ultimately repaid in full with the addition of compound interest at the rate of at least 4 per cent. If the present price of timber was maintained, the return would be much larger. That was very promising for the future of forestry and of putting soldiers on the land.

There need be little doubt that under good management Mr. Tennant's optimistic forecast of the profit to the State will be justified, and that any outlays incurred will be made good with adequate interest. It may be hoped also that his association with this scheme will stimulate the new Secretary for Scotland to more energetic action than has hitherto characterized his Department and its branches in this important question.

An Effort to Compile Losses on Licensed Lands

Limit Holders Co-operating With Canadian Forestry Association to Secure Statistics of Forest Fires

A hearty response from timber limit licensees in Ontario has resulted from the efforts of the Canadian Forestry Association to obtain a definite estimate of losses by fire on licensed forest lands of Ontario in 1914, 1915, 1916.

There is at present no official means of obtaining such information. The Ontario Government has no data on fire damage beyond some returns as to the number of fires reported by rangers, probably the least important item of all. As long as the Governments are themselves ignorant of the annual fire damage how many anyone expect a protective policy patterned upon actual needs? Why expect the public, lulled by promises of generalization, to initiate any movement calling for reform?

Purpose of the Forms.

The Canadian Forestry Association scarcely hopes to secure this year sufficient statistical information on the losses sustained by limit holders to justify a general estimate. The chief object is to place the questions before all timber licensees in at least one of the provinces as a means of suggestion to them, and particularly to the provincial government, that such evidence should be carefully compiled and turned to public account. It is indeed an amazing thought that the annual damage on 10,000,000 acres of Ontario's best forest lands, under license, should not be known promptly to the Government and people. The lack of such public knowledge of the frittering away of the common assets certainly serves a purpose in hiding an inefficient state of forest protection work, although it is not to be assumed that successive governments have any hoodwinking tactics in mind. They continued inefficient systems because forest protection has been allowed to take its little corner as a purely departmental item, without any live relation to those public policies that win or lose votes. It is but fair to acknowledge that forest guarding, as far as Ontario is concerned, has quit its cubby-hole and is to-day a matter of intelligent public discussion and vigorous agitation.

The replies of the Ontario licensees will be dealt with more fully in the November issue. A few of the comments are as follows:

Licensees' Remarks.

"We lost $11,000 in one township in 1913. It is most disheartening trying to do anything towards protection on our own holdings when contiguous government-owned territory is left unprotected."

"The fire was started on abandoned timber berths, and we understand and believe that these lands were left entirely unprotected.

"Our last large fire was in 1911. During that year we had some 15 or 20 miles of timber berths burnt over at points very far removed from each other. Most of the territory had been cut over, but was coming along well to young pine. This was mostly killed by the fires. During that year we lost in camps, outfits, etc., destroyed by fire $10,000."

"For the most part the appointees as rangers (on certain limits) consist of young college men who are utterly incompetent to perform the duties, being neither bushmen of experience nor

qualified in any other way to perform the duties expected of them. These men do not take the position of fire ranging with the intention of safeguarding the limits against fire. Some of them could not locate a fire and fight it, even if they were willing."

"During the past three years large areas on the Montreal River pulp concession have been destroyed, the result of prospectors and mine owners being practically allowed a free hand in that valuable timber. All protests lodged with the Department have been of no avail."

A copy of the report form is given below:

Total area of our limits in Ontario is:—

———

Location and *origin* of main fires.

Area burned in 1916	acres	1916
Area burned in 1915	acres	1915
Area burned in 1914	acres	1914

———

Kind of tree growth and estimate of quantity destroyed (board measure):
1916
1915
1914

———

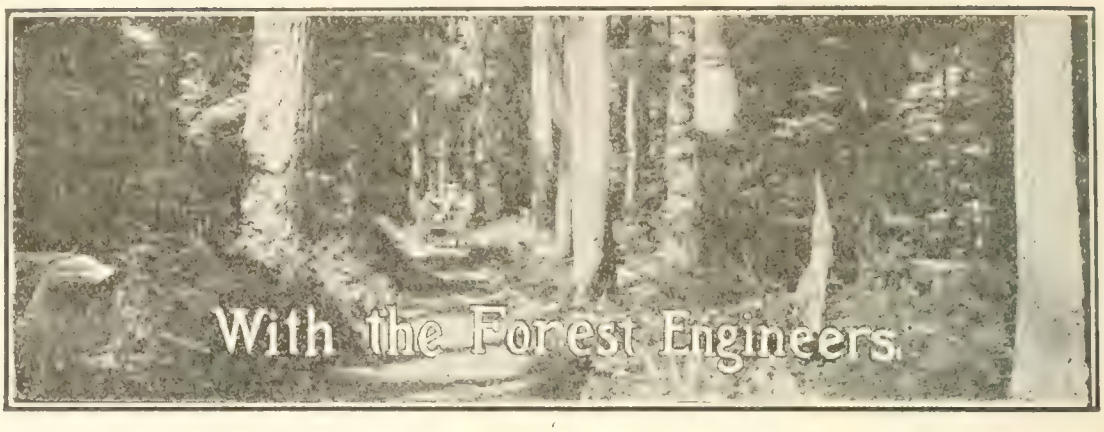
Estimated value of burned timber. (Basis of valuation to be stated):
1916
1915
1914

———

Estimated value of equipment lost by fire, such as: caches, supplies, tools, machinery, logging gear, etc.:
1916
1915
1914

———

Total loss from forest fires in Ontario, including all items and allowing for timber salvaged or to be salvaged:
1916
1915
1914
How many guards employed?
REMARKS:



(Forestry Notes of Department of Forestry, University of New Brunswick.)

According to the Yale Forest School News of October 1st Harold C. Belyea, who has been in charge of the examination of the Crown Land in Madawaska County, N.B., will return to New Haven about November 1st to assist Prof. Record with a study of tropical woods, going in as laboratory assistant.

All the foresters will regret to hear of the death of Captain Robert K. Shives, of the Royal Flying Corps, in London, on September 29th, in a Lewis machine gun accident. Shives made an enviable record as an aviator, having been recommended for the D.C.M. for gallant conduct. He had spent about six weeks at his home in Campbellton, and had just returned to England, and was expecting to go to the front again when the unfortunate accident occurred. His loyalty to the forestry camp will always be remembered, as he was one of the prime movers in building it.

Kenneth R. Vavasour, of the class of 1914, recently resigned his position with the Dominion Forestry Branch, and has enlisted with the 226th Forestry Battalion .

The spruce bud worm, whose work was noticed during the summer by several of the Crown Land survey parties, promises to be a serious pest in New Brunswick unless some of its natural enemies come to the front to hold it in check. It is especially bad on balsam fir, and returning from a recent trip on the Maguadavic river to investigate the damage done, Provincial Forester Caverhill believes that in certain infested areas clear cuttings of balsam may have to be made this summer. Other species of beetles are already at work in dying trees, so that this step may be necessary if timber of commercial value is to be saved.

There are about fourteen men registered in the Forestry course in the University of New Brunswick, which is considered very good for this year. Freshman, Sophomore and Senior classes are the only ones represented by full courses, many students having enlisted. Among those who have returned to resume their studies are George Miller and Leo Kelly, who have been engaged with the Dominion Forestry Branch; Kilburn and Crandall, who have been engaged in G. H. Prince's party in the survey of lands between the Miramichi and Bartholomew rivers; Roy Christie, who has had a very successful summer with Mr. Gareau, of the J. B. Snowball Company, Chatham, N.B.; Mr. Taylor, who was incapacitated for overseas by appendicitis. Among the others are Mowat, transferring from Arts to Forestry; and of Freshmen entering are Webb, Betts, Seely, Stevens, Wheeler, Sutherland, and Adams.

Among the U. N. B. men still engaged on Crown Land survey work after changes in parties due to the return of several students to college are: G. H. Prince, in charge near Boisetown, N.B.; Belyea, in charge in Madawaska county, under whom are Williams and Jago; Burns and Young, near Anderson, N.B., and Brewer and Melrose,

near Boisetown. The work will proceed until heavy snows come.

With the B. C. Men.

Victoria, B.C., Sept. 26, 1916.

M. A. Grainger, Acting Chief Forester, who outlined briefly the scope of the B. C. Forest Branch and its relation to the lumber industry, and H. R. MacMillan, who tendered evidence concerning the export position as affecting the B. C. lumber industry, were among the witnesses examined by the Dominion Royal Commission during its sittings at Victoria, September 20-22.

Mr. H. R. MacMillan, who for the last year and a half has been engaged in a study of the lumber export markets of the world, for the Dominion Department of Trade and Commerce, has tendered his resignation as Chief Forester to the Hon. W. R. Ross, Minister of Lands, in order to accept a position with the Victoria Lumber and Manufacturing Co. of Chemainus, B.C. Mr. MacMillan was one of the first Canadians to take up Forestry as a profession, and has been prominently identified with the forestry movement in Canada for almost ten years, first in the Dominion Forestry Branch, and since 1912 with the British Columbia Forest Service.

His former and present associates will keenly regret Mr. McMillan's decision to sever his connection with governmental forestry work, but wish him all success in his new position.

Mr. Louis B. Beale, Lumber Commissioner for British Columbia, stationed at Toronto, has returned to Victoria for consultation with the Forest Branch, and the lumber manufacturers, concerning the future development of that important work. The B. C. lumber exhibit under Mr. Beale's management at the recent Canadian National Exhibition, attracted notable attention, and as evidence of the growing interest in the Eastern market for British Columbia woods, it may be mentioned that during the first two or three days over 3,000 samples of woods were taken away by persons interested, and hundreds entered their names to receive further information, etc.

The active service list of members of the B. C. Forest Branch continues to grow, and to date 68 have enlisted, in addition to 47 forest guards. Messrs. Mitchell and Rees have won the Military Cross.

Lieut. H. K. Robinson, chief of surveys, wrote recently to the Forest Branch from the doubtful security of a dug-out in one of the front line trenches.

Personal Items.

(Notes of enlisted members from Forest Laboratories, Montreal.)

Lieut. L. L. Brown went overseas as a private in No. 2 Sanitary Section, but early in the summer was transferred to No. 1 Canadian Tunnelling Company, and received commission. He has been ill for some time, and is in hospital in England.

Sergt. F. W. Fraser, 14th Battalion, is in hospital in England, having been badly wounded in June when a high explosive shell injured his left thigh.

Captain M. W. Maxwell, No. 1 Canadian Tunnelling Co., went over as lieutenant last January, and was recently promoted to a captaincy.

Capt. L. N. Seaman, Adjutant, Canadian Brigade Siege Artillery, went across to England with the Siege Artillery last winter, and has been prevented from getting to the front on account of two injuries, the first on June 3, right arm broken cranking a motor car, the second on August 5, right leg broken near the ankle by driving a motorcycle into a ditch.

Capt. R. A. Spencer, No. 1 Canadian Tunnelling Co. Recently awarded the Military Cross for distinguished services. He was also promoted to captain. There have been numerous reports of his good work at the front.

Any Member of the C. F. A.

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(Courtesy Grand Trunk Railway System.)

VISTA ON LAKE OF BAYS, ONTARIO.

Future of the B. C. Forest Service

The resignation of Mr. H. R. MacMillan as Chief Forester of British Columbia to become Assistant Manager of the Victoria Lumber and Manufacturing Company, leaves a blank in the forest service of the province which will require the utmost care in filling. Mr. MacMillan's qualifications embraced thorough technical training, a varied practical experience, good judgment, and unquenchable enthusiasm. If the British Columbia Forest Service is to continue to have as skilled direction as Mr. MacMillan was able to give to it, the selection of a successor must be patterned upon qualifications of an equally high order. The Forest Service has not been in operation so long as to run automatically or to disregard for a moment the personal capability of its director. It is precisely at the stage where, having fixed itself as an essential in the provincial machinery, skilful and determined guidance is required to adjust it to the special problems of the future. There is reason to believe that the new Premier will find no difficulty in appointing a Chief Forester without violating the Civil Service principle to which he has committed his Government.

At the present time the Forest Service of British Columbia has special claims upon the new government for the most generous consideration. The large number of enlistments depleted the forest guarding forces so that the excellent record of the past two years

has been achieved by a reduced staff working under abnormal pressure. It would seem a mistake from every point of view to allow the common practice of a "clean up" at the change of governments to take from the Forest Branch any serious percentage of those holding records as efficient and experienced rangers. Such men cannot easily be replaced, and none of the trifling considerations of patronage should deprive British Columbia of their future services.

Hon. Mr. Brewster has plainly pledged his Government to a disregard of the patronage system, and if this pledge is carried out to the full, no alarm need be felt for the maintenance of efficiency in the Forest Branch.

A Forecast of Post-bellum Demands

United States lumbermen seem to be keenly alive to the unparalleled opportunity for business which will come after the war. At a meeting held in Chicago on August 21 a plan for a survey of the export markets was approved, and the statement was made — based on reports already in hand — that the demand for lumber after the war will be "almost beyond belief." Secretary J. E. Rhodes, of the National Lumbermen's Association, in speaking of these reports, said:

"France as well as other foreign powers has shown a strong prejudice in favor of American lumber. Tentative plans have been made by France and England to rebuild the devastated portion of Belgium. The northern part of France will necessarily be rebuilt, and from the present outlook it appears that the French Government will undertake the rebuilding. Already the French Government is considering the practicability of rebuilding towns and villages on a community basis, with model farms on the American plan. It is said that this action has been largely influenced by the activities of the Southern Pine Association in demonstrating the qualities of southern yellow pine and its adaptation to the needs of the country."

Almost unanimously the lumbermen agreed that the proposed study should be undertaken, that the markets may be entered intelligently, and as soon as possible. The necessity of shipping the proper grades of lumber for certain uses was emphasized, and it was urged that the men making the survey should be practical lumbermen, with a knowledge of the manufacture and marketing end of the business. It was pointed out that the indiscriminate making up of cargoes of any class of lumber, whether suited to the needs of the rebuilding of Europe or not, and the dumping of these cargoes upon the market, would prove very harmful to the permanent export of American lumber, and the investigation is to be undertaken largely to determine the different grades and classes of lumber for the different uses, and to inform the European governments of this as well as the American shippers. If possible the investigation will include other countries than those at war.

A summary of the conditions in belligerent countries—as presented to the meeting—shows the following:

Belgium.—The forests have been entirely destroyed and the nation so wrecked physically and financially that it will have to be entirely rebuilt, and this rebuilding will have to be financed by the Allied powers.

Northern France.—Northern France will have to be entirely rebuilt. A great deal of railroad construction will have to be undertaken; so much indeed that it is said the number of ties, sleepers and timbers is beyond estimate at the present time. This same condition holds true with regard to the farm buildings, villages and cities of the section. This need will be defi-

nite, regardless of the outcome of the war.

England.—The forests of England and those of Scotland have been almost entirely cut in an endeavor to secure material needed at the front and for building construction brought on by the war. Lumber will have to be imported for practically all future building until new forests grow to take the place of this timber.

Italy.—The supply of Italian timber has been almost entirely used either in Italy's war operations or exported for the benefit of the allies. It is said that great quantities of lumber are in immediate demand.

Spain.—Because of the geographical situation Spain has been called upon to supply lumber to the warring nations, with the result that all marketable timber has been cut.

Germany.—So far it has been impossible to secure any estimate upon the conditions of Germany's timber, but it is known that it has cut as much timber as possible from the invaded portions of France, Belgium and Russia, and has conserved home resources as much as possible. However, it is expected the demand from Germany for foreign lumber wil lalso be very great.

Russia.—The supply of standing timber in Russia is very great, both in the Baltic Provinces and in southern Siberia, but owing to the lack of development of the timbered sections and poor transportation facilities the timber will not be available to the Allies for some time after peace is declared. Much development work will have to be done before Russia takes a dominating position in the lumber world.

What Forest Fires Cost Canada in 1916

Canada has lost through forest fires in 1916 fully seven to nine million dollars. This equals more than six times what has been spent on forest protection work from coast to coast.

The enormous sum wasted through this year's fires, most of which were preventible, would add another $480 to the first year's pension allowances of nearly 19,000 Canadian soldiers.

It is noteworthy that while some parts of the Dominion owe to rainy weather their immunity from fire damage, the season's record proves beyond gainsay that in areas where first rate fire protection systems were in operation, losses of life and property were held down to a remarkable minimum.

Strong Delegation to Meet Ontario Cabine

A deputation representing the leading commercial interests of Canada will wait upon the Minister of Lands and Forests of Ontario and his cabinet colleagues in November to urge their views regarding the necessity for immediate reorganization of the Ontario system of forest protection.

The deputation, which has been organized by the Canadian Forestry Association, will include representatives of the Canadian Bankers' Association, Canadian Manufacturers' Association, Canadian Lumbermen' Association, Canadian Press Association, Canadian Mining Institute, Canadian pulp and

Paper Association ,as well as the powerful labor union of International Woodworkers.

A memorandum containing evidence regarding the inadequacy of the Ontario forest service, and the records of up-to-date protective systems in other provinces and the states of the American Union will be laid before the Cabinet, with suggestions for a plan of improved procedure which Ontario might follow.

"The Curse of the Forest."

"The Curse of the Forest," a motion picture of a real forest fire, showing methods of fighting and the destruction which follows in the wake of a forest fire, have been completed by the Vitagraph Company in co-operation with the Pennsylvania Department of Forestry.

Building a Telephone Line

The Forestry Branch has planned to extend the forest telephone system as rapidly as proper experience and skill are secured in the work and as funds permit. Four meetings were held this summer by the Branch for purposes of instruction in certain phases of telephone work, and were attended by sixty rangers and supervisors of the permanent field staff in Alberta and Saskatchewan. Each meeting lasted from six to eight days, and the entire time was devoted to lectures on the special types of telephone equipment used on forest protection lines, and to the practical work of line construction and operation of equipment. This work was under the charge of Prof. W. N. Millar, of Toronto University Forest School, who, in addition to a theoretical knowledge of telephony has had eight years of practical experience in the construction of hundreds of miles of forest telephone lines, beginning with the first lines of this character built by the United States Forest Service in Northern Idaho in 1908.

Special Construction.

It is not, perhaps, generally realized that the type of line construction adapted to forest protection purposes has, in the past five years, become very thoroughly specialized and that it differs materially from the ordinary methods of rural and commercial construction. This specialization is rendered necessary by the fact that many forest protection lines must, for reasons of economy, be built through heavy timber without clearing the wide right-of-way demanded in commercial construction. Of course, where a suitable open right-of-way is available construction methods and specifications are similar to those employed on ordinary rural lines, but this is the exception rather than the rule.

Briefly decribed, forest protection telephone systems consist of grounded lines built of number 9 B.W.G. galvanized iron wire hung on trees instead of poles, and using a special split tree insulator instead of the usual well-known type of glass insulator employed on poles. To prevent damage from falling timber and swaying trees, certain rules of construction must be very carefully observed. These provide for a careful equalization of spans, for the leaving of a very large amount of slack, for the placing of ties on the concave side of all curves, for the staggering of supports out of a straight line, and for the employment of special methods of attaching the insulators to the trees so devised that when an excessive strain comes on the line wire, as through the fall of a tree, the wire will be detached from the support and carried to the ground, but will not break. The whole construction aims to produce a line that, while resisting all ordinary strains, yields at once to exces-

sive strain in such a way as to insure absolutely against line breakage. In this it differs radically from the well-known methods employed in ordinary commercial practice, which produces a line of extreme rigidity because the open right-of-way insures against the danger of falling timber to which the forest line is constantly exposed.

The Cost of Building.

Given normal prices for material, a line starting at a railroad, standing green timber through which to build, and proper skill in construction and supervision, a first class tree line can be built as low as $25 per mile, but will usually run from $35 to $45 per mile. Where the haul is longer or where supplies must be packed on horses, and especially where dead timber or heavy underbrush is encountered, this cost may be increased to from $50 to $65 per mile. Station equipment and line construction tools are, of course, additional. The latter cost about $100 for a crew and last for many years.

Maintenance on a properly constructed tree line is very low unless the line runs for a long distance through standing dead timber. Ordinarily an annual or semi-annual overhauling at a cost of not more than $1 per mile is sufficient, in addition to requiring patrolmen to repair all injuries to the line in their district as they occur. In green timber these are inconsiderable, but in dead timber where trees are constantly falling, at least one man day per month to each 15 miles of line for maintenance work should be planned for. Of course, nearly all forest telephone line maintenance is carried on in connection with fire patrol, from which it is difficult to separate it in a cost record. Such lines have a life of from fifteen to twenty years.

About 710 miles of telephone lines have been constructed by the Dominion Forestry Branch during the past four years in the 25,000,000 acres of reserves in the four western provinces. The mileage is distributed as follows:

Alberta Reserves	75 miles
Alberta Reserves.....	265 miles
Saskatchewan Reserves	50 miles
Manitoba Reserves	320 miles
Total	710 miles

Ready-Prepared Lectures

For the use of clergymen, teachers, and others desiring to present an illustrated lecture on the forests of Canada, the Secretary of the Canadian Forestry Association has completed the manuscript of a new "forest travelogue," entitled

"Guarding the Forests."

Fifty-six photographic lantern slides are supplied with the manuscript, and will fit any standard make of stereopticon.

The manuscript, to be read by the lecturer, contains a general introductory talk, together with running comment on each of the 56 slides, so arranged as to make public presentation as interesting and effective as possible.

Conditions.

Applicants are required to pay express charges both ways (usually from 50 cents to $1.00), and to return slides and manuscript in good condition on the day following the lecture.

As the Canadian Forestry Association is able to provide a very limited number of these free Lecture equipments, it is necessary that applicants inform the Secretary where the lecture will be held, under what auspices, and the date best adapted to local conditions.

The offer of the Association applies only where the applicant is able to state that at least fifty adults will be

present at the lecture. . .Exceptions will be .made in the cases of High Schools and Colleges.

Other ready-prepared lectures in course of preparation are "The Abandoned Farm" and "Putting the Forest to Work."

Canadian Forestry Association,
119 Booth Building, Ottawa.

Largest Sassafras.

The largest sassafras tree in America is growing in an old burying ground at Horsham, Penna., and is 15 feet 10 inches in circumference at four feet from the ground. Unfortunately nothing remains of the tree but the trunk with one fair-sized branch, still in vigorous growth. The trunk is hollow, and shows signs of great age.

Politics and Fire Ranging.

From an old Ontario guide, Sept. 15, 1916: "There is one thing I would like to see done, and that is to appoint fire rangers regardless of the political party that they were attached to.

"It is just that kind of work that makes a woodsman sick of the whole thing, for to think that they have to support a government paying salaries to such men as these, just because he took an active part in politics at the last election."

The Forests of Alaska

R. S. Kellog, Assistant Forester, U. S. Forest Service.

The ordinary resident of the United States has no conception of what Alaska really is. He has heard of the "Klondike" for the last fourteen years, and he wrongly thinks it is in Alaska. He has heard of great glaciers and high mountains, and that somewhere the thermometer occasionally registers 80 degrees below zero. Beyond this his knowledge is likely to be even more fragmentary and unreliable. In reality, Alaska is of continental dimensions, and one can no more state briefly what its characteristics are than he can similarly describe those of the entire United States; yet a few words concerning its most salient features will not be amiss.

Alaska was purchased from Russia in 1867 for $7,200,000. The value of all its products since that date has been nearly $350,000,000. It has an area of 586,000 square miles, or 375,000,000,000 acres, or more than ten times that of the State of Illinois. From southeastern Alaska to the end of the Aleutian Islands is as far as from Savannah, Ga., to Los Angeles, Cal. Its northernmost and southernmost points are as widely separated as Canada and Mexico. Its range of temperature is greater than that between Florida and Maine.

Transportation in summer is by steamboats on the larger streams and by poling boats on the smaller ones; in winter, by stages where the roads are good enough, and more generally by dog teams. Alaska has 4,000 miles of navigable streams. It does not have even a territorial form of government, though during the past few years it has had a delegate in Congress. Called a territory by courtesy, its anomalous standing for years was that of a customs district. It has executive and judicial officers appointed by the President and the Senate, but no legislature; all legislation is by Congress.

Forest Types.

The differentiations between forest types are as sharp as those between the topographic and climatic, and, of course, depend upon them. The coast forests of southern Alaska are the northernmost extension of the coast type in Washington and British Columbia. The interior forests are an extension of the interior Canadina for-

ests. The forests of the Susitna and Copper river basins are somewhat intermediate in character, since these rivers rise in the interior and break through the mountain barrier to the southern coast.

On the coast of south-eastern Alaska trees grow to large size; in the interior the timber is much smaller. The higher mountain areas are completely above timber line. Climatic conditions in the region adjacent to Bering Sea and on the Arctic slope make forest growth altogether impossible, so there are great stretches of tundra whose vegetation consists chiefly of moss, sedges, and a few small shrubs. Moss may be said to be the garment of Alaska, and layers of it 12 to 18 inches thick are not at all uncommon either on the coast or in the interior.

It is estimated that the total forest and woodland area of Alaska is approximately 100 million acres, or about 27 per cent. of the land surface of the territory. Of these, about 20 million acres may possibly bear timber of sufficient size and density to be considered forest in the sense that much of it can be used for saw timber, while the balance, or 80 million acres, is woodland which bears some saw timber, but on which the forest is of a smaller and more scattered character and valuable chiefly for fuel.

Timber Contents.

There is not sufficient information upon which to base any satisfactory estimate of the total stand of timber in Alaska. It has been estimated, for instance, that the coast forests contain 75 billion feet of merchantable saw timber, but this estimate might be much exceeded were both the spruce and hemlock closely utilized. More than twenty cords per acre have been cut in good stands of birch and aspen in the interior, but, on the other hand, there are large areas of black spruce that is too small to use for any purpose; so that it is still impossible to give a satisfactory estimate of the total stand.

The Coast Forests.

The coast forests or south-eastern Alaska are nearly all included in the Tongass and Chugach National Forests, which comprise 26,761,626 acres; and a large proportion of this area is forested. The species are chiefly western hemlock, Sitka spruce, western red cedar, and yellow cedar, with occasional specimens of lodgepole, or shore pine, black hemlock, Alpine fir, black and white spruce, balm of Gilead, locally known as balsam poplar, black cottonwood, Oregon alder, and several birches and willows. Sitka spruce and hemlock grow almost everywhere in this region, though in Kenai Peninsula the spruce extends farther westward than the hemlock and grows also on Kodiak Island. The cedars grow in commercial quantities only in the extreme south-eastern part, though yellow cedar is occasionally found in the Chugach Forest. Lodgepole pine grows as far north as Skagway, but is of no commercial importance.

Growth and Stand.

In the coast region the stand is generally dense, and as much as 25,000 feet per acre has been estimated for considerable tracts. Sitka spruce probably averages 20 per cent. o fthe stand, and western hemlock about 75 per cent. The spruce reaches a large size, and occasionally attains diameters of more than six feet and heights of 150 feet. Diameters of three to four feet are attained by western red cedar. While by far the most abundant species, western hemlock does not produce as large individual trees as the spruce or the cedar. The heavy rainfall causes an undergrowth of moss and brush which completely covers the surface except where it is too rocky or too steep. So dense is this surface covering that one may walk long distances without touching bare soil. Water exudes from the moss when it is stepped upon, as from a sponge, and consequently there is little or no damage by fire in the coast forests.

Practically the entire forest of the coast region is over mature. It has been accumulating for ages uninjured by fire or cutting. Shallow, rock soil, steep mountain slopes, or poor drainage often prevent sturdy growth, and on such sites "stagheadedness" and decay are common. In favourable situ-

tions the rate of growth of the coast trees is fairly rapid. The following examples are typical:

A western red-cedar stump in good soil on the south slope of a gorge above Ketchikan showed 235 rings. The diameter of this stump outside the bark was 38 inches. A 40-inch Sitka spruce stump in the same locality had 230 rings. This tree had been 125 feet high. Near Wrangell three Sitka spruce logs averaged 32 inches in diameter at the butt inside the bark, with 262 annual rings.

Local Wood Prices.

Wood is sold by the dealers in Fairbanks at from $9 to $10 a cord, with an added charge of $2.50 for cutting to stove lengths. Slab wood can be purchased for $2 a cord at the sawmills, but for heating in the winter it is not as satisfactory as round wood. The river steamers pay $6 and $8 per cord for 4-foot wood, ricked up on the bank. Wood choppers are paid $3.50 to $4 per cord. Both spruce and birch are used, though birch is preferred. Poplar and aspen are generally left uncut. Aside from this the wood choppers make clean cuttings and utilize the timber closely, often taking the limbs and tops down to 3 inches in diameter, cutting the stumps close to the ground, and piling the brush well to get it out of the way of the haulers.

Forest Fires.

Unlike the coast forests of Alaska, the interior forests have suffered much from fire. Except on limited areas the cutting which has so far taken place in the interior is not serious, but the fire damage has been great. It probably would not be far from the truth to say that in the Fairbanks district ten times as much timber has been killed by fire as has been cut for either fuel or lumber. Fire follows the prospector and the settler, and everywhere that a mining camp develops under present conditions it is to be expected that fire will kill much of the timber. There are several causes for this. Miners and hunters are careless. Camp fires are neither properly guarded nor extinguished. A fire gets out and no one pays any attention to it unless it threatens his camp. Fires, too, may be set to clear off the ground so that prospecting is easier. Fires have been purposely set to secure dry timber, and the slashings along the telegraph lines have been another source of danger. Smudges are built to keep away the mosquitoes; in fact it is commonly said by the residents that mosquitoes cause more fires than any other one thing. The rainfall is light during the summer, and it does not take a long period of drought to make the forest burn rapidly. In the Klondike region, and on the upper Yukon, in Canada, fires have done even much more damage than in Alaska. During the entire trip of 460 miles down the river from Whitehorse to Dawson, one is almost constantly in sight of fire-killed forests. Much fire-killed timber is also seen along the Yukon in Alaska from Eagle to the mouth of the Tanana, but from that point to the beginning of the tundra the forest, though small, is, for the most part, as yet undamaged by fire.

The danger season is short, with extreme limits approximately from May 15 to September 15. During 1909 there was a bad fire near Fairbanks early in the season, but none during July or August. On the other hand, there were fires along the Yukon in both the latter months. No measure but the posting of notices are taken to prevent forest fires in the interior of Alaska, and little is done to control them, except as they immediately threatened some one's property.

Coming Demand for Timber.

Alaska has a permanent future. For the southern and south-eastern coast its chief potentialities lie in fishing and in lode mining of gold and copper; for the interior there is the mining of gold, copper and coal, and in certain localities there are opportunities for agriculture. Fairbanks and Nome have passed their palmiest days as placer camps. With crude equipment and high-priced labor, the placer miner can work only the richest ground. His time is soon over. The low-grade ground, which is always the most extensive, can be worked profitably only by large capital and the most economi-

cal methods. This stage has already been reached in the Klondike. It is coming in Alaska. This will mean long-time operations. Then, , too there is the probable development of lode mining for gold, which also requires large investments and long-time operations. There are agricultural possibilities in the Tanana and some other valleys. Nearly every cabin in Fairbanks has a fine vegetable garden. Large quantities of potatoes are already raised, and occasional fields of oats and barley. The government has experiment stations at Rampart and Fairbanks, which are growing both grain and vegetables. Agriculture in the interior of Alaska should eventually be sufficient to supply at least the local needs for vegetables, and for horse and cattle feed. Enthusiasts predict a large population for the Tanana Valley within the next twenty-five years. Transportation at present is slow, expensive, and uncertain by means of river boats, which operate only a few months of the year. The building of one or more trunk lines of railway would greatly accelerate the development of the country.

These resources already hold great promise, and doubtless there are others which cannot now be anticipated.

The present sparse population will undoubtedly be greatly augmented before many years. Alaska is almost a continent by itself, and so far removed from the rest of the United States that it should eventually depend as much as possible upon its own resources. This makes it particularly necessary that the timber should be conserved. The present population is made up largely of miners and others whose only purpose is to make a stake and leave as quickly as possible thereafter. They are only too willing to skin the country for their own benefit, without thought for the future. This will change as soon as people go to Alaska expecting to make their home there for at least a considerable period of years, and there are already some families of this sort in the Tanana Valley.

New Brunswick's Good Work.

About 200,000 acres of New Brunswick's forested lands have thus far been covered by the forest survey parties under the able direction of Mr. P. Z. Caverhill. Some of the maps are nearly completed.

A development of special interest to readers of the Journal has been the extermination of areas for settlement purposes. The Premier and his colleagues were so pleased with the progress made and the promise of great results from classification of lands that orders were given for a soil type map covering the whole forest area of the province. This will be taken as a guide in the opening up of lands for settlement. The question of improved fire protection is under consideration, and this will be pressed forward with the least possible delay. New Brunswick has already made a good start in experimenting with burning permits for settlers' fires. The forest and soil survey, with modern fire guarding, will place New Brunswick in a proud position.

British Columbia Lumber Trade.

In a recent communication to the Department of Trade and Commerce, Mr. H. R. McMillan, Special Trade Commissioner o fthe Dominion Government, says that he regards the condition underlying the future trade in Canadian lumber as very greatly improved. With special reference to British Columbia, he says that in regard to the supply of bottoms, work is now actually going forward on nine ships, which when completed will carry about 40,000,000 feet per year, worth with outward freight earnings about $1,000,000. Three of these ships are being built in Victoria and six are being built in North Vancouver, all of which are being financed by Pacific Coast lumber companies. Already the cargoes have been sold in Australia for loading in early 1917. These ships are being built under the British Columbia Act upon terms of which the outward bound cargoes must be Canadian. Eight of these ships wil l be launched and outfitted with three hundred and twenty horse-power Diesel engines . The ninth will be prepared

for engines, but will be operated under sail until the engines, which now cost double the normal prices, can be purchased advantageously. There is a likelihood that other companies now investigating the question will build ships. The markets for which these boats are being built are Australasia, China and Africa.

Mr. McMillan says that oversea buyers have always advanced as one argument in favour of buying in the United States the more extended lumber manufacturing facilities existing on the Pacific coast of that country as compared with Canada, but upon having discussed this point recently with the leading operators of mills and several of the leading owners of stumpage, a conclusion that a betterment of Canadian conditions is now in sight was reached.

"Farm Forestry,"

(By John Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College.)

This book, just received by the Canadian Forestry Journal, covers the subject of forestry as applied to the farm woodlot, and is especially intended for text-book use in agricultural colleges and high schools. It is the outgrowth of lectures delivered to agricultural students throughout several years.

The author's aim has been to treat the subject from the broad standpoint of the woodlots in the great plains and prairie regions as well as in more eastern regions.

The subjects included are those of essential interest to the agriculturist. The establishment of the woodlot, both by seeding or planting and by natural methods, is discussed with hints as to the best trees to plant in different sections. The care and protection of the woodlot is treated and also the very important subject of woodlot management. A conception of the woodlot as forest capital is given, with suggestions as to the amount of wood to remove annually and the methods of securing a sustained annual yield. Chapters are also devoted to the harvesting and marketing of woodlot products and to wood preservation. In the apendix there is included a suggested list of practicum exercises for a course in farm forestry.—Book Department Canadian Forestry Journal ($1.25).

Severe Forest Laws of Plymouth Fathers

In a recent issue of the Journal, an article told of the strict laws for prevention of forest fires instituted by Governor Simpson and Council of the Hudson Bay Company in the early years of Canadian history.

Even more interesting reminders of the austere regard of our great grandfathers for forest preservation are contained in a publication written by J. P. Kinney of Cornell University, entitled "Forest Legislation in America Prior to March 4, 1789." It will be a revelation to most readers of the Journal to learn that forest preservation and extension in America did not have their real beginnings in the nineteenth century, but "that forestry and timber problems had claimed the attention of colonial legislative bodies on many occasions during the seventeenth century, and that hundreds of such laws had been enacted previous to the establishment of the national government."

Timber "Famine" in 1626.

Many years previous to the adoption of the Federal Constitution on March 4, 1789, many of the colonies, as was natural, had been brought to realize the ill effects of forest fires, attempting, as they were, to wrest a livelihood from what then was in reality an

impenetrable forest. Even as far back as March 29, 1626, Plymouth Colony began to cry the wolf of timber famine, which to us of this day seems almost amusing. The Plymouth ordinance of 1626 recited the inconveniences that were likely to arise in any community from the lack of timber, and declared that no man should sell or ship any timber whatever out of the colony except with the Governor's or Council's approval. Was this the original seed of conservation, or was it due to a realization that here were illimitable quantities of fine timber at their very doors, and with the proverbial New England thrift and foresight they desired this resource to remain forever within their little colony?

"Only Upon Warning."

As early as 1633, in the Plymouth Colony, the setting of fires in the woods was forbidden during the fall and winter months, and the firing of woods during the remainder of the year was allowed only upon warning to one's neighbors. The stern and grim penalty for breaking this law was a fine of 10 shillings or a whipping. The restriction regarding the setting of fires in Massachusetts Bay Colony antedated the Plymouth law, being passed in July, 1631. Here also a whipping was the wholesome penalty, to be administered to either man or woman breaking the law. Other New England colonies very early passing some form of forest or fire legislation were New Hampshire, Connecticut, and Rhode Island, most of the laws providing for an open season for setting fires. Rhode Island prohibited the setting of fires in the woods except from March 10 to May 10, and on Saturdays and Sundays within this period.

Damages or Stripes.

New York, under the Duke's Laws, published in 1665, likewise forbade setting fires out in the woods or commons or on one's own lands, and the person so doing should be liable for one and a half times the damage, and in default should receive stripes. New Jersey and Pennsylvania passed forest fire laws in 1683, and Delaware, as a separate colony, in 1739; North Carolina, in the acts of 1777, went on record against fires, stating that forest fires were "destructive to cattle and hogs, extremely prejudicial to soil, and oftentimes of fatal consequence to planters and farmers by destroying their fences and other improvements." Here we get a new point of view—that forest fires were injurious to the soil, and therefore to planters and farmers—but nothing was said of the destruction of the timber. The North Carolina laws went more into the details of the penalties, stating that any vagrant, slave, free negro, or mulatto unable to pay the fine, should "receive on his bare back 39 lashes, well laid on." Would that such a Federal law existed today! Our fire organizations and plans would be useless.

Laws Far Afield.

Not only did the early colonies realize the disadvantages of fires in the forests, but provided restrictions on shipping lumber, the felling and not using of timber, restrictions in the cutting of timber for one's personal use, prevention of timber trespass, cutting of timber on another's land, etc.

Typical of the name which he gave to the State, William Penn published a document in England which, among other wise things, declared that care must be taken to leave one acre of trees for every five acres cleared; whether the selection, clear-cutting, or strip-system, was to be followed record sayeth not.

Maryland, in 1692, granted certain free use of timber to any one who would build a mill. The General Assembly of Virginia, in a letter dated March 28, 1628, to the King, advised him that pipestaves, barrel boards, and clapboards, as well as pitch and tar, could be procured in great abundance, but that the freight was too high! Not until 1752 did Virginia recognize the need for timber inspection, although Massachusetts Colony had provided for, for barrel staves for export from Virginia to Madeira and the West Indies, the Virginians probably being brought to realize the importance of having good, solid barrel-stave material from having suffered a loss of many gallons of good old Madeira in its long journey across the Spanish Main.

The bulletin tells us that the standard cord measure, as used to-day, was fixed by the Massachusetts Bay Colony in 1647, being adopted later by practically all the other colonies.

Tar Manufacture.

The British Crown early manifested an interest in the timber and timber-product resources of the colonies. Connecticut in 1644 granted two men the privilege of making tar under certain restrictions in the colony, although later some of the inhabitants made a complaint on account of the disagreeable smell of the tar near their homes. Thus in 1644 began the American naval stores industry. In 1671, Massachusetts Bay Colony granted a company a ten-year monopoly "to make for sale pitch, rozin, turpentine, oyle of turpentine of the pine or cedar trees."

"With a view to establishing a permanent source of naval stores within its own dominions, the British Parliament in 1704 passed an act which placed bounties on tar, pitch, rozin, turpentine, hemp, masts, yards, and bowsprits imported from the American colonies into Great Britain. For the preservation of trees fit for the production of naval stores, this act imposed a fine of five pounds for the offence of cutting or destroying a pitch pine tree or a tar tree, under 12 inches in diameter, 3 feet from the ground, not within a fence or an actual inclosure, within the colonies of New Hampshire, Massachusetts Bay, Rhode Island, Connecticut, New York, and New Jersey, and fixed a fine of ten pounds for the offence of wittingly or willingly firing any woods or forest in which there were trees prepared for the making of pitch or tar, without first giving notice to the person who had prepared the trees for the making of pitch or tar, in any of the said colonies."

Regulate Grazing.

Nor were the interests of the colonies confined to forest fires, timber inspection, and barrel staves, for as early as 1739 the Massachusetts General Court declared that great harm had been done to the beech grass on the shores of Cape Cod by cattle and horses, and that as a result the sands were drifting inland, causing great destruction, and thereupon prescribed a fine of 40 shillings per head for each neat cattle, horse, or mare that was turned loose upon the meadows and beaches of Truro. Thus we get the first record of an attempt in America to regulate grazing. And a stiff trespass fee was wisely imposed!

The Paper Making Art in Egypt

(The Egyptian Gazette.)

Egypt once kept the greater part of Europe supplied with paper. At first, it was made of the cellular pith of the papyrus laid in strips side by side and a further layer laid above the first crosswise; the whole was then damped with Nile water and pressed. Later the Arabs made paper from rags, and among other names given to it was "charta cuttunea," because it had a cottony appearance, which gave rise to the idea that at one time paper pulp was made here from cotton wool. So much paper was made and exported from Alexandria at one time that the Emperor Hadrian was particularly impressed when he visited the city with the great and flourishing trade in this article.

It is strange to reflect that after having been, as it were, the home of paper, Egypt is to-day absolutely dependent on her imports of this material. The question naturally arises, Is it possible for Egypt once more to make herself at least partially independent in this direction?

Competition Keen.

Paper making is a highly specialized industry, specialized in that every maker keeps to certain lines, and develops his plant to produce out of the material at hand certain quantities at the cheapest rate. He is unable to compete if he tries to produce too many kinds at his mill. This is particularly noticeable in the enormous development in the last twenty years of the news mills, where every detail of the huge modern plants is arranged for making one quality of paper only. In such a mill there would be, perhaps, five or six machines, each turning out every minute of the twenty-four hours of the day 750 feet of paper in a width on each machine of 150 to 180 inches.

From forest to breakfast table, the production of the newspaper is a romance of the highest order. Yet these same specialist mills would be all at sea if they were expected to produce a sheet of, say, ledger or tissue paper. The result of such an attempt, even if the managers knew the requirements of the market, would be to turn the whole mill in about five minutes into a huge waste paper basket.

Experiments Unavailing.

If, as was remarked above, the paper makers endeavor to produce out of the material nearest at hand, what material is there in Egypt to induce the manufacture of this necessary article in the country? Cannot such material as rice, straw, sugar cane stalks, banana leaves, etc., be used?

Experts have, for many years, experimented with all classes of plants in order to test their value as a paper making material, and much valuable information has been gathered from these experiments. But after a certain stage of experiment has been reached the same impasse is always arrived at. The fibre of a plant may, under treatment, yield a beautiful cellulose pulp desirable in every way, but further investigations prove that the amount procurable is too small and uncertain, and the difficulties of collection and transport prevent the develop-

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ment of the scheme into a commercial success. Furthermore, the competition of the wood pulp mills is always in the way.

Municipal Forestry.

Forestry can never appeal to individual enterprise on a large scale, says the Toronto "Globe" 'in a recent article. Returns are too slow. As a national enterprise of the highest importance it is gaining recognition, and there is a tendency among some American cities to take advantage of its many possibilities. With the exception of the vicinity of the Great Lakes, the world's largest reservoir of pure fresh water, cities must have water supplies from available drainage or watershed areas. These can be devoted to forestry with advantage from a sanitary point of view, and also with profit when the trees begin to mature. Where convenient, the forested area can also be made to serve as public parks. The city of Fall River, Mass., began in 1909 to plant trees in Watuppa Pond Reservation. There are 3,232 acres of land belonging to the municipality in a natural forest condition, and 1,552 acres suitable for reforesting. The trees are supplied by the State Forestry Bureau. The Metropolitan Water Board, which represents Boston and other cities in this matter, has planted, chiefly in the Wachusetts Reservation, about 1,800 acres with forest trees. In six years the State forestry service has furnished to the cities of the State a sufficient number of trees to cover 1,481 acres, and it is estimated that 15,000 acres in city reservoir tracts have been put under some kind of forest treatment. Massachusetts has gone beyond the use of watershed

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reservations for this purpose. An Act was passed by the Legislature three years ago permitting cities to buy land to be kept distinctly as forests, quite aside from water purposes. There are now several of these city forests in existence.

Elsewhere in the United States the same tendency exists. In ten large and middling-sized cities forest domains aggregating over 150,000 acres are maintained, and it is probable that municipal forests comprise 250,000 acres. Newark, N.J., has a forest of 22,000 acres, and in time the whole of it may be scientifically forested. Hartford, Conn., has a forest property of 4,000 acres, which is being developed for timber production. Here are examples for Canadian cities. Winnipeg's water development may be made to serve a double purpose. Eve nToronto's suburban ravines, though unsuited and unnecessary for water supply, might serve the dual purpose of timber production and park systems. Municipal trading has many critics, often unreasonable, but municipal reforesting should be made a possibility where Provincial authority is neglecting its duty in that regard and falling behind in the march of progress."

Editor's Note: The laws of Ontario permit the establishing of municipal forests, but no municipality has seen fit to take advantage of the privilege, common as are the examples in Europe and the United States.

Game Sanctuaries.

By E. R. Kerr.

The system of Game Sanctuaries for the bringing back of mild life is badly needed and desired because it will bring back some of the vanished game.

This system would take nothing from the public domain. It would not change the legal status of one acre of public land, except by protecting the game upon it from being killed.

It would sequestrate no agricultural lands and no grazing lands. The areas in view for these sanctuaries are the wild, remote, rugged and now useless regions, utterly useless for agriculture and for grazing. Any settler who goes into such a region to live is doomed to perpetual poverty because he cannot conquer steep mountain-sides and V-shaped valleys.

It is not the part of wisdom to let those now desolate regions forever remain desolate. Even the sheepmen and cattlemen admit this,—so far as heard from.

If the people, during our last campaign, had not said that they desired these sanctuaries and all that they will do for Ontario, we would not now be working on the establishment of Game sanctuaries and the organizing of protective societies or bodies throughout the Province. No one has been asked to try and "rush" legislation through the House.

This whole matter is proposed to the Legislature on a basis of absolute good faith. It is not intended as an "entering wedge" for big appropriations and a lot of new high-salaried positions; but eventually it will cost a very small sum of money per year. If the plan is not worth a small sum of money each year, it is not worth considering. We call it real, "constructive conservation," on a large scale, at practically no extra cost.

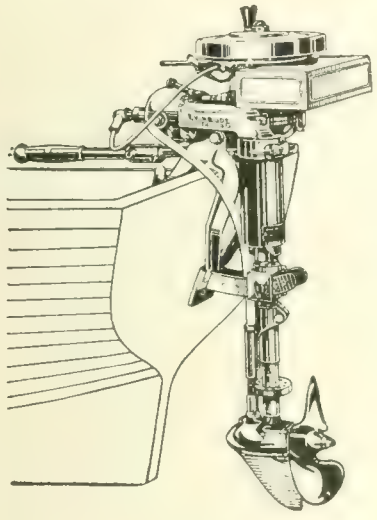
If at any time the people of Ontario decide that the public welfare demands the breaking up of sanctuary areas, and their opening to settlement and land speculation, then "let the tail go with the hide,' 'and deconsecrate and break up the game sanctuaries at the same time. I can stand it if all the other sportsmen can.

Many men and boys in Ontario will be affected by the proposed sanctuary plan of bringing back wild life. Many men and boys go hunting each year, and kill game—if they can find any. To them this sanctuary plan means a continuation of legitimate sport.—Reproduced from "Rod and Gun."

Against Xmas Tree Export.

The following letter reached the Journal from a prominent Ontario lumberman:

"So many millions of young evergreens are cut each fall, and sections of the north country are devastated,



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that I feel action should be taken to stop it.

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"The Government does not reap any reward either for the trees taken off the public domain, nor from an export duty, but a lot of swipers reap a rich harvest. Many hundreds of cars are shipped each year. I think it should be stopped. M. C."

Substitutes For Wood Pulp.

According to press despatches the Germans are substituting paper made from nettles for the ordinary paper made from wood-pulp. This is nothing new, says Pulp and Paper Magazine. From all parts of the world, almost from the time when paper was first made, there have come reports regarding substitutes for wood. In turn, announcements have been made that paper made from straw would replace wood; paper from corn stalks; from cotton hulls and from various kinds of grasses.

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It is quite true that paper can be made from these various commodities, but the cost of providing it in commercial quantities is so great as to prohibit the development of any such industry. Doubtless, the Germans are hard put to and will be forced to substitute many inferior commodities for the materials they formerly used. This will be true not only of paper making, but in connection with munitions and all kinds of industry.

The Pulp and Paper Magazine has no great fears that a substitute will be found for wood pulp, so in our opinion possessors of valuable timber and pulp forests can go to sleep at nights without worrying. Wood is stil lsupreme for paper making.

Approximately 330,000 cords of wood waste with a value of $1,400,000, were utilized by 35 of the 200 pulp and paper mills of the United States. It is thought that as the price of cord wood goes up, the amount of wood waste used will become greater.

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From Toronto "Globe."

"It is most deplorable that the lesson o fthe recent fire disaster is passing unheeded by the Ontario Government. That the clay-belt fire in July last was the third most serious fire catastrophe in the history of the continent is pointed out by the Canadian Forestry Association in a circular appealing for the adoption of efficient protective measures. Ontario has made no such move toward the adoption of effective measures, although she has suffered the greatest of recent disasters. Such neglect is simply intolerable."

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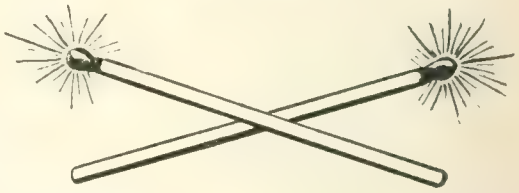

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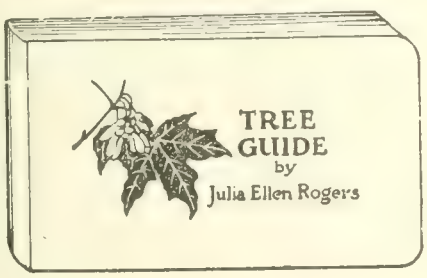

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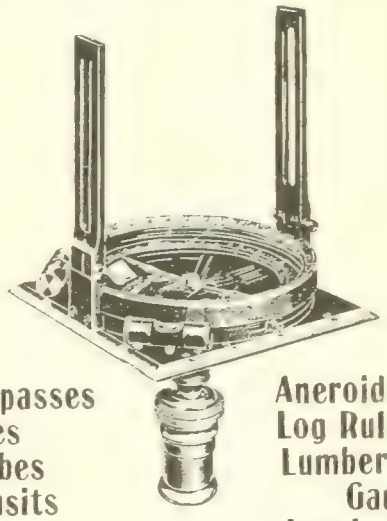

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A Newsy Issue.

In "The Outlaw" in the October number of Rod and Gun Magazine, which is now on the news-stands, H. C. Haddon gives some intimate details in the life of a family of wolves, which the writer observed at first hand, from the birth of the cubs up till the time when one of their number became a famous hunter and a destroyer of cattle on the ranch of a Western farmer. In "A Bull of Triple Creek" A. Ray Giddings gives a dramatic account of a fight between two bull moose, the human element being supplied by the two trappers and a woman, the wife of one of the trappers ,who witnessed the encounter between the two rival bulls, and one of whom is narrowly rescued from death. The Light That Saved, Camp Magis, On the Trail of the Wounded Bull Moose, A Story of Eggs and Skins, and other articles besides the regular departments, constitute an interesting issue for the sportsman whose thoughts at this time of the year are turning to the opening of the big game season. W. J. Taylor, Limited, Woodstock, Ont., are publishers of this representative Canadian publication.

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"It is noteworthy that Wisconsin, Minnesota, Maine, and New Brunswick have taken comprehensive measures to prevent further disasters by organizing their forest patrol systems on modern lines, building trails, lookout towers, telephones, etc., as well as carefully supervising settlers' clearing fires, one of the worst sources of danger. Ontario, which has given the continent its two most recent fire catastrophes, has made no such move to modernize her forest-guarding system."—Toronto Star.

White pine blister rust, which has been engaging the attention of Provincial Forester E. J. Zavitz in Ontario most of the summer, has appeared near Montreal, and Mr. G. C. Piche, Chief Forester of Quebec, is ascertaining its extent.

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The Association prepares and places through its Publicity Department, many hundreds of special articles every year, reaching the Canadian Public through daily and weekly newspapers, weekly and monthly magazines, including agricultural, financial, religious, literary, engineering, juvenile, and practically all divisions of Canadian journalism.

Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

Campaigns for forest protection through its Publicity Department, the distribution of illustrated literature to settlers, campers, etc., the presentation of lantern slide cartoons in motion picture theatres, and many other methods calculated to bring practical results.

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These are a few of the concerns of the Canadian Forestry Association.

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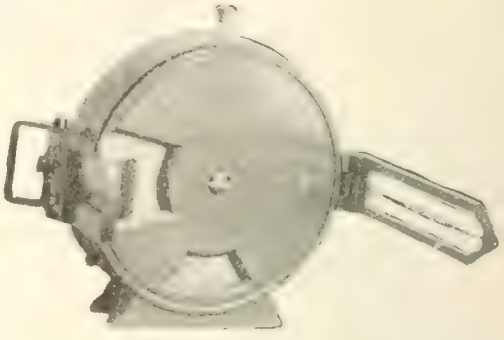

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Canadian Forestry Journal

VOL. XII

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The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

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119 BOOTH BUILDING OTTAWA.

Printed by the British Whig Pub. Co., Kingston, Ontario.

A scene in woods operations of the 224th Canadian Forestry Battalion in the North of Scotland. The pine shown here is about 150 years old.

In Scotland with the Canadian Forestry Battalion

A Running Description of Unique Conditions Encountered by the Khaki Woodsmen from the Dominion

By D. H. Smith.

Perhaps one of the most interesting emergency committees arising out of the world war is that of "The Home-grown Timber Committee," which had its rise in the Department of Agriculture in the British House of Commons.

As the vastness of the war began to impress itself upon the minds of our statesmen, and the submarine tactics of Germany became a factor in the struggle, the Government was brought face to face with the problem of the supply of the great quantities of timber products required to carry on operations in France. The submarines of Germany were causing trouble on the sea, and bottoms were fast becoming too scarce to permit of large lumber shipments. The American firms, while anxious for orders for lumber from our Governments, were not in a position to contract to lay the material down in Europe owing to the absence of an adequate American merchant marine. Norway and Sweden

were not willing to impoverish their own supply by meeting too large a demand. Hence the British Government were forced to look for their supply within their own forests, and it was these conditions which led to the creation of "The Home-grown Timber Committee," as we have it to-day. This committee was to procure timber when and where it could in the British Isles, and for this purpose they were given the right to confiscate.

Solving the Labor Problem.

Upon large tracts of timber being procured, the Committee were met by the problem of getting labor for its manufacture. Men were brought from Ireland, and operations started in various parts of the country. German prisoners and coolies were also employed in this manner, but the demand continued to be greater than the supply, and it was at this point that the 224th Canadian Forestry Battalion, of which the writer is a member, was brought into existence. As has been already stated in your columns, this battalion came over to Britain last spring, bringing with them a full equipment of mills, waggons, cant hooks, axes, etc., all ready for the bush.

Part of the men and equipment were started working in England, and the remainder came to Scotland, of which it is our intention to speak.

Forests Clean as Parks.

One of the first things which strikes the "Colonial" upon entering the wooded areas here is the absence of windfalls and underbrush, the ground being clean like a park. This condition is largely due to the fact that areas are reforested ones, and the stands for the most part are as yet far from mature, and are in a very healthy condition. The stands are composed nearly altogether of lodgepole pine and larch. One can see some white birch and a little white fir in certain localities.

On one of the operations where cutting is being carried on the stands are of two ages, i.e., sixty-five and one hundred and fifty years. At sixty-five years of age the pine may give ten thousand B. M. per acre, considering the closeness of utilization, while the hundred and fifty year-old stand should yield about twenty thousand B. M. One hundred and ten trees to the acre seems to be about the average.

Larch Reproducing Well.

The larch appears to be reproducing very well from its own seed, but of course there is no reproduction from the pine. The British Government advances money to landlords for reforesting purposes at a rate of 2½%. Approximate cost of reforesting an acre in Scotland is £25, and from observations on an operation it can be seen that at sixty-five years of age an acre will give an approximate return of £50. Taxes on wooded areas must be considered in any such computations.

Methods of Felling.

In felling, the trees are of course cut close to the ground, and every part of the tree is utilized. The trunk is cut in the following manner: Up to 10″ in diameter and 9′ in length for ties (sleepers); from 10″ down to 7″ in diameter for logs; from 7″ down to 3″ in diameter for pit props, and from 3″ to 1″ for firewood. Thus to the "Colonial" mind a logging operation here seems more like a land-clearing operation at home. The standing timber has been purchased on a basis of a shilling per cubic foot, which figures out to $25.25 per thousand feet board measure.

Ties are in the greatest demand at present, as they are used not only for railroads but also in the moving of the big guns, being laid end for end, also in setting up these guns. They are cut 9′ in length, and are sawn in several sized faces, from 6″. A tie is worth $1.75 in England to-day. Pit props, which are used in mining operations at the front, and for erecting wire entanglements, and in the revetment of trenches, are not in great demand at present, in comparison with ties.

Scotch Saw Mills.

The Canadians mills in use are semi-portable ones, cutting from 20 to 30 thousand feet B. M. per day. A Scotch mill, with a capacity of from 3 to 5

thousand feet B. M. per day, is utilized on some operations.

These Scotch mills are a source of amusing interest to the Canadian lumber jack. The engine sits on top of the boiler, and the mill is driven by a fly wheel. The logs are fed to the saw on a platform which lies on rollers. These rollers are forced to turn by a man turning a crank, and the platform is pushed forward, thus causing the log to go forward against the saw. Some mill!

Everywhere one turns in England and Scotland one sees large areas of shrubbery and of trees of little value from a commercial point of view, areas which might be contributing in a goodly measure to the nation's demand for timber if planted in proper species. This is especially so in England, and yet, if it had not been for the action of landlords years ago in planting the areas we are now cutting, the timber problem would be a serious one indeed. Whether the land owners were actuated in the matter by a farsightedness or merely as a hobby to have wooded areas as a place for game, it is difficult to say, but one thing is certain that as soon as the war is over the British Government will put into force a permanent and comprehensive forestry policy which will ensure reproduction of commercial species of timber on at least the areas now being cut over.

The Future Market.

Of course Canadians would like to see this timber supplied from our own vast and superior forests, but we may well take time to consider that if the abnormal demand created by the war is being supplied in Britain, more of the normal demand in peace times must of necessity be supplied by Canada, as the reserves are being used up in Britain. Thus we see that the submarine warfare has not caused us to lose our market for the supply of this timber, but rather caused its postponement.

Forest Fires in Manitoba.

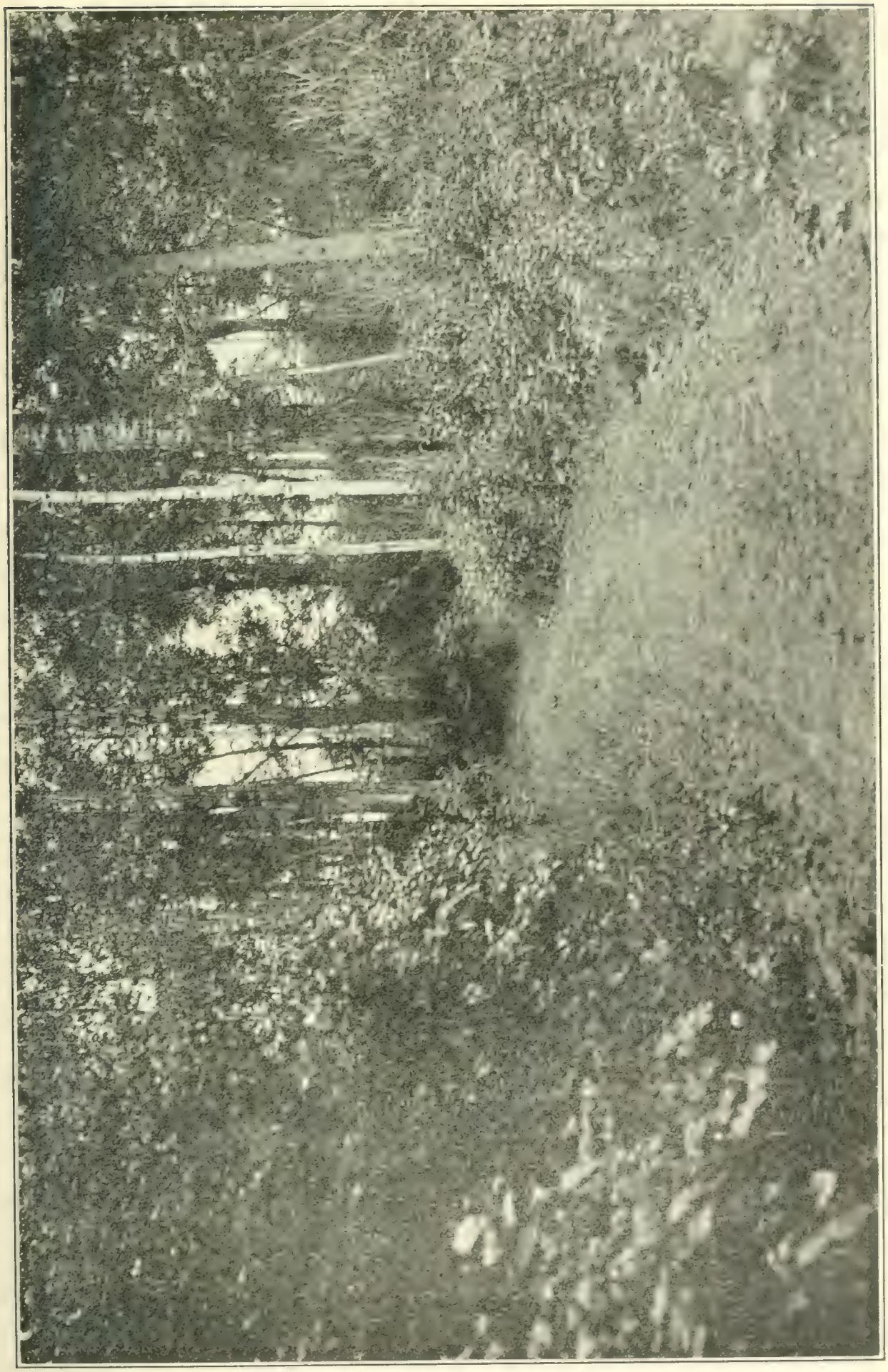
(Winnipeg Telegram, Oct. 27, 1916.)

As a result of the loss of two hundred and sixty-two lives in forest fires in Ontario last summer, the government of that province is now considering the advisability of adopting regulations to prevent a recurrence of the disaster. It is probable that Ontario will imitate the example of Quebec and British Columbia in requiring settlers to take out a permit before burning the slash and deadwood on their clearings. Such permits are not issued in the dry season nor under circumstances where there is danger of the fire spreading.

The Canadian Forestry Association has issued a leaflet giving a number of excellent reasons why a similar policy should be adopted in Manitoba. People are not accustomed to think of Manitoba as a forest province, but as a matter of fact it contains quite extensive timber areas which are gradually being penetrated by settlers, and, unless precautions are taken in time, there will some day be just such a holocaust as has caused so much suffering and financial loss in Ontario.

It is found by experience that a permit law actually facilitates settlement and that where it has been tried the settlers quickly appreciate its advantages as safeguarding their homesteads from dangerous conditions. As a further consideration it is to be remembered that in northern Manitoba much of the soil is non-agricultural, and if stripped of its forest by haphazard fires the loss will be practically permanent.

Presumably the Canadian Forestry Association has brought, or will bring, the matter to the attention of the Manitoba provincial administration. Without raising the question of who should pay the cost of protecting our natural resources, it is the manifest duty of the province to look after the safety of settlers. The expense involved would not be large, and the benefit accruing would ultimately be very great.



Near Sprague, Manitoba, showing Poplar type of growth. The dense undergrowth here indicates very favorable conditions.

Better Protection for Western Forests

Governments Asked to Stop Needless Destruction by Settlers' Clearing Fires—A Promise of Improved Conditions

The effect of the war in bringing Canadians to appraise natural resources from the point of view of broad public interest has had its share in the improved relations of the prairie provinces toward their local timber possessions. Beyond any doubt, the West is coming to see that irrespective of questions of eventual provincial control, the guarding of the forest assets plays into the hands of the Western people, while forest neglect through indifference of local or federal governments collects its toll from within the provincial boundaries. Despite an impression to the contrary, the Dominion Government makes no gain on a year's operations of the Western forests, but is out of pocket many thousands of dollars for protection and administration. Without taking sides on the claim of the provinces for control of natural resources, it is manifest that the forests must continue for many years a financial liability on whatever government undertakes their management, and that thorough protection from fire and all forms of waste at the present day can have only a good result, the enhancement of an essential public asset throughout Manitoba, Saskatchewan, and Alberta, thereby increasing the quantity and cheapening the costs of the local wood supplies, and finally making a large and permanent contribution to the public revenues.

While one might point to many most necessary reforms in the handling of the Western timber lands, Government toleration of such disadvantages can be ended only by a vigorous and well-informed public opinion. The pressure must come from the West itself. If the political patronage system is playing hob with the efficient administration of the forests, as who may doubt, the protest must come from the Western people who know the facts at first hand and are most directly concerned. In this great public service, the Western members of the Canadian Forestry Association are possessed today of a fine opportunity. They realize the necessity for better conditions, and have plenty of public spirit to impress their enlightened ideas upon tardy administrations. Only continual publicity and agitation will set aright the forest policies affecting the West. Wrong methods, extravagant systems, have their consent in public ignorance. Education puts them to flight.

A First Step.

A few weeks ago the Canadian Forestry Association set out to obtain at least an elementary concession in the interests of fire prevention in the timbered lands of Manitoba, Saskatchewan, and Alberta. We refer to the adoption of a form of "burning permit" law which would keep down the losses from settlers' clearing fires in all timbered areas.

It is well known that most of the new immigration is homesteading in the northern forest-covered lands. That introduces the same sort of fire peril as startled the country through the Claybelt Horror of North Ontario last summer. The settler must use fire to clear his land. No one seeks to deny him that right, but clearing fires are points of grave danger to human life and to public-owned timber properties. The greater part of the northern areas has no soil fit for farming, and if the millions of acres are to be kept out of absolute desert, they will have to be retained under timber crops. In other words, the farmer must arrange to employ fire for its legitimate purpose, namely, clearing his

BURNED JACK PINE, STURGEON RIVER DISTRICT, SASKATCHEWAN.

land for field crops, but he must not be allowed to burn off neighboring lands of no use for field crops and profitable only under timber. That seems a very reasonable business proposition.

Damage Through Settlers.

The fires of settlers have been the main source of forest destruction throughout the West. Rangers have had no authority to prevent them, and have been forced to take responsibility for numerous damaging fires which could have been nipped in the first place by simple restrictions on the careless settler.

The Provincial Governments have full authority to devise and enforce a law along lines somewhat similar to the "permit law" in Quebec, British Columbia, Nova Scotia, and part of New Brunswick, penalizing a settler who lights a clearing fire in the danger season without first obtaining a "permit" from a ranger. This permit stipulates several reasonable precautions such as selection of proper weather conditions, piling brush away from standing timber, vigilance in guarding against spread, etc.

If the Provincial Governments prefer to give the administration into the hands of the Dominion Forestry Branch, the "Journal" understands that this condition would be acceptable, and further that the Dominion Forestry Branch would place on duty sufficient extra rangers to make the issuing of permits convenient to the settlers. This would relieve the provinces of most of the expense in putting the new law into operation.

Dr. Roche's Good Work.

An excellent move in the matter of overcoming fire hazards in forested lands of the West was made by the Minister of the Interior, Hon. W. J. Roche, recently, when he authorized a proviso in all future homestead patents that settlers in timbered country must not set clearing fires without permits from officers of the Dominion Forestry Branch. This safeguard will take care of the fire troubles of future settlements. But the present body of settlers in the danger zone must be covered by an enactment of the provincial governments.

Scores of Western members of the Canadian Forestry Association have written, at our suggestion, to their local representatives in the Legislatures, also the Ministers of Agriculture, ex-

pressing support of the Association's proposals. We urge similar action upon all our members residing in the prairie provinces. The effect of such letters is incalculable in holding up the hands of the provincial authorities willing to accede to sensible public demands.

AMOUNT OF TIMBER IN PRAIRIE PROVINCES.

(From Address, "Timber in Canada," by R. H. Campbell, Director of Forestry, Ottawa, delivered at San Francisco, 1915.)

Province	Total Land Area.	Estimated saw timber area.	Estimated stand.
Alberta	161,000,000 acres	5,416,000 acres	21,000,000,000 board feet.
Saskatchewan	155,764,080 acres	3,584,000 acres	14,000,000,000 board feet.
Manitoba	148,432,640 acres	1,920,000 acres	6,850,000,000 board feet.

In the Forest Reserves.

		Percentage of total area.
Alberta	16,711,776 acres	14.00
Saskatchewan	6,197,707 acres	3.97
Manitoba	2,606,400 acres	1.75

	Population per square mile.	Percentage of total area in permanent forest.
Belgium	652.	18.3
France	189.5	18.7
Germany	310.4	25.9
Switzerland	234.8	22.7
Sweden	32.4	47.8
Russia in Europe	64.6	31.0

YOUNG MIXED FOREST OF PINE AND SPRUCE IN ATHABASCA RIVER VALLEY, ALBERTA.

Oregon Fire Losses $500.

Oregon, which enjoys modern forest protection, suffered practically no loss from forest fires this year, according to State Forester Elliott, despite the fact that the timbered and brush area owned by the government and private individuals and companies comprises approximately 22,000,000 acres. The entire damage from fires, Mr. Elliott says, will be less than $500. Last year the loss on privately-owned timber lands totaled $29,000.

Oregon has 13,125,000 acres within the National Forests, of which about 10,000,000 acres is commercial timber land. There are 10,000,000 acres of privately-owned timber land patroled by the state and timber owners. In addition to this area there are approximately 2,000,000 acres of brush land in the southern part of the state.

"A total of 114 fires were reported to our office in July and the first part of August, 52 of them being in Jackson and Josephine counties. These fires were extinguished without damage of consequence."

A SETTLER'S CLEARING IN THE TIMBERED COUNTRY OF SMOKY RIVER VALLEY, ALBERTA.

GROWTH IN VALUE OF EXPORTS OF FOREST PRODUCTS

For the first eight months of the present year, January to August, inclusive, the increase is 18 per cent. as compared with 1915, and 25 per cent. as compared with 1914:

	1913.	1914.	1915.	1916.
January	$1,983,980	$2,159,088	$1.811,049	$3,243,360
February	2,212,485	1,961,206	2,342,590	2,595,420
March	2,359,351	2,694.986	3,440,941	3,247,691
April	1,869,715	1,847,739	1,929,440	2,287,939
May	3,039,563	3,296,455	3,487,103	4,174,038
June	4,323,636	4,511,249	4,904,152	5,846,672
July	4,938,716	5,097.065	5,876,784	7,257,805
August	5,063,551	4,256,635	5,846,897	6,209,357
September	5,347,458	4,945,471	6,527,625	.....
October	4,505,067	4,935,715	5,503.343	.....
November	4,107,090	3,439,970	4,556,502	.....
December	2,782,061	2,698,804	3,553,083	.....
Totals	$42,532,673	$41,871,383	$49,779,509	*$34,862,282

*Eight months.

White Pine Endangered by Disease

During the past summer several inspectors under direction of Mr. E. J. Zavitz, Provincial Forester of Ontario, have conducted a systematic examination of areas of the province infected with blister rust, a dangerous disease of White Pine. The results of their work are now being prepared for publication in the annual report of the Department of Lands, Forests and Mines. The disease has been found in several points throughout the older part of the province, in Simcoe, Durham, Wellington and Victoria counties; the latter are said to be of limited scope and from present appearances can be eradicated. The most seriously diseased area is along the Niagara Peninsula, and in this region action to overcome the trouble presents a difficult problem. During the fall and winter a considerable number of pine will be taken from diseased areas. The Minister, Hon. G. H. Ferguson, is giving every aid to the solution of the problem.

The following bulletin issued by the Massachusetts State Board of Agriculture is informing:

Trouble in the U. S.

State nursery inspectors, state foresters and other official representatives from New Hampshire, Vermont, New York, Pennsylvania, Rhode Island and Massachusetts, met at Fall River, Massachusetts, on September 25, at the invitation of the Massachusetts State Board of Agriculture, to examine a serious outbreak of the white pine blister rust on native white pine. This examination proved plainly to all that the blister rust is a deadly enemy of the white pine.

Reports given by the representatives of the states showed that the white pine blister rust is already widely prevalent throughout the New England States and eastern New York, and as this dangerous disease uses the currant and gooseberry as a host plant to grow upon, and spreads very rapidly from currant to currant and from the currant to the pine, it was the unanimous opinion of all present that, as the only way to avert the impending catastrophe and save the white pine would be through a complete destruction of all currant and gooseberry bushes and flowering currants, the public should be given this information at once.

New Ways of Taking Dollars from Forest Waste

How Forest Possessions Are Being Increased by Making One Tree Do What Two Did Before

By Frank J. Hallauer,

In Charge, Section of Review, Forest Product Laboratory, Madison, Wis., U. S. A.

(In view of the excellent work being accomplished by the Forest Products Laboratories at Montreal, the following article describing the far-reaching activities of the Forest Products Laboratory at Madison, Wisconsin, will be of great interest to our readers.—Ed.

The press is almost daily calling attention to what necessity and science are doing toward the development of forest products abroad, products necessary for feeding and clothing the people, for safeguarding public health, hospital supplies and ammunition for carrying on the war. The advantage of the publicity which the war has given to these developments lies in the fact that we will have a greater appreciation for the possibilities in our own forest resources. It will probably be a surprise to most people to learn that no country, with the exception of Germany, has made such a systematic effort at developing her forest resources as has the United States. The Forests Products Laboratory at Madison, Wisconsin, established in 1910 by the Forest Service of the United States Department of Agriculture, in co-operation with the University of Wisconsin, was the first of its kind in the world.

Wood Uses in War.

Abnormal conditions have aroused new interest in some lines of forest products, including the older products such as charcoal, acetone, etc. Charcoal is used in the manufacture of black powders and in driving bullets from shrapnel. The successful use of nitrocellulose powders depends upon a solvent which will probably gelatinize the nitrated fibres, and all the acetone employed as a solvent is made from acetic acid, a product of hardwood distillation. Great Britain is dependent upon the United States for acetone in producing her cordite. Black walnut has been the standard gunstock, and the demand has so nearly exhausted our supply that other woods, notably birch, are being substituted. There is also complaint of a shortage of willow for wooden legs.

Even in times of so-called peace we have battles to fight in which we are dependent upon forest products. Disinfectants have found their place in the sun as necessities of life, at least human life as against some other forms of life, and it is worth while to point out that pure wood alcohol is the only substance which can be converted on a commercial scale into formaldehyde, which is used universally for disinfection against such contagious diseases as smallpox, scarlet fever, diphtheria and tuberculosis. It is also used to prevent crop diseases by disinfecting the seeds.

Forests are of most immediate importance, however, as a source of raw material for our industries. Our for-

est products industries employ over one million wage-earners and the products, including re-manufacture, are valued roughly at two billion dollars annually. These industries have been cutting timber at three times the normal rate of growth, and it is estimated that already 2,300 billion feet of the original 5,200 billion have been consumed. Such a rapid rate of consumption carried with it the danger of a timber famine, which would be killing the goose that laid the golden egg. The timber famine meant a loss in national wealth represented by this vast resource and an industry employing ten per cent. of our wage-earners.

What Conservation Means.

Conservation in the utilization of our forest products has averted this end. We are doubling our forest resources by making one tree do what two did before. To illustrate:

The pulp mills and distillation plants will use woods and mill waste;

The lumberman will take twice as much material from the woods as formerly;

The life of turpentine operations will be doubled by shallow chipping, etc., etc.

Such developments are no longer hypothetical; their practicability is actually being demonstrated; **for example, one lumber company in the Lake States region reports the removal of three times the material from the forest and the employment of twice the number of men formerly employed in producing an equal amount of lumber. A lumber company in Pennsylvania—one of the most progressive in the country—is securing from its waste a gross return of $124 per acre, or thirty-four per cent. of the total gross return from its hemlock and hardwood logs.**

More intensive manufacture provides for industrial growth, which was previously provided for by expansion of lumbering operations. A natural increase in the value of a tree will make possible the practice of advanced forestry methods, which will react by increasing the products of the forest, thus completing the cycle.

With one-third of the tree coming through the mill as lumber, the greatest opportunity for conservation is in the utilization of the other two-thirds. This conservation means the manufacture of a greater diversity of products and a development of uses or markets for these products. Briefly, that is the purpose of the Forest Products Laboratory.

As a Fertilizer.

The early practice of leaching wood ashes as a part of the home soapmaking has disappeared, but it is now being revived as a source of potash to offset the shortage of fertilizer due to the war.

In the Red River Valley of Texas the Indians long ago used osage orange for dyeing, but it had never gained commercial recognition as a dyewood. Within the last year, however, the laboratory has succeeded in getting it into the market as a substitute for fustic which we import from Jamaica and Tehauntepec, and over a million dollars' worth of this dye is now being made by our American manufacturers, and this from mill waste.

While making a chemical analysis of western larch it was noticed that there was an unusually high percentage of water-soluble material. This was found to be "galactan." Now if this material can be converted into a fermentable sugar, which seems probable, western larch would have a considerable advantage over other woods as a raw material for grain alcohol. The laboratory has been working on the production of grain alcohol from wood for over five years, and has been successful in experimental work in raising the yield and lowering the cost of production. The process has the advantage in that it uses small material, unselected, except that coniferous species give higher yields than do hardwoods, and to most mills producing waste in excess of their power requirements its disposal means an actual expense.

The extraction of rosin from fat wood has not been particularly successful because of the excessive loss of solvent and because the rosin is only medium grade. The wood is chipped before it is extracted, and these chips after extraction were practically a waste. Experiments at the laboratory

have shown that if the chips are made of the proper size they can first be put through the extraction process as before and then converted into pulp.

Converting cellulose into a gelatinous material known as viscose opens up still another field of research for the utilization of wood waste and adding a new line of products running all the way from sausage casings to tapestry. Many of the "silk" socks, neckties and fancy braids now on the market contain artificial silk made from wood.

Employing Kraft.

Experimental kraft has been made at the laboratory, using longleaf pine mill waste, which compares favorably with the best krafts on the market. Kraft differs from other papers in that it is much stronger, due to the less severe action of the chemicals. It is brown, like what we usually think of as wrapping-paper. Large quantities of it are used for that purpose, and it is particularly suitable for large envelopes. It is used for book covers, for imitation leather and for cardboard suitcases, etc. Gummed strips are used in place of string for tying packages. Cut into strips, either with one side gummed and spread with a fine lint or used plain, it is run into a spinning machine and twisted into threads. This thread is then woven into such products as onion and coffee bags, matting suitcases and bags, wall covering similar to burlap, furniture resembling the reed, coarse mattings, twine, etc. So far attempts to make binder twine from kraft have not been successful, but should the diculties be overcome this alone would provide for the utilization of a large amount of wood waste and at the same time build up a home industry independent of foreign raw materials.

There is much of the work of the laboratory which is of considerable importance to the industries, but is of less popular interest.

Over a hundred thousand tests have been made on commercial American timbers on which to base specifications for timber construction. Supplementing these tests, further tests on boxes and barrels have resulted in a revision of specifications of the Interstate Commerce Commission for containers for shipping explosives.

It is estimated that sap stain causes an annual loss of over $7,000,000, which experiments have shown can be prevented.

The wood-block pavement is frequently objected to because of swelling and bleeding. By bleeding is meant the oozing of oil from the treated blocks. Means are being developed for overcoming both difficulties.

A study of the operative features in a destructive distillation plant resulted in one case in increased yields of products to the amount of $15,000 annually.

This is only representative of what has been done in the comparatively few years that forest products investigations have been under way. The per capita consumption of lumber is gradually decreasing with increases in population, whereas the per capita consumption of other forest products, notably paper, increases. These natural tendencies and scientific investigation will together operate toward complete utilization of our forest resources, which, as previously stated will mean much for the economic and industrial welfare of the country. It will not be necessary to increase continually the annual cut of timber, or the annual lumber output, in order to maintain a normal growth of industries dependent upon the forests for their raw material.

Dyes from Osage Orange.

The manufacture of dyes from the waste of osage orange wood has become a commercial success as a result of investigations. Carloads of wood are now being shipped to eastern extract plans from Oklahoma, and the dye is being produced at the rate of about $750.000 per year. Before the establishment of this industry, the waste of orange wood had no market value and the extract plants were importing dye wood from Mexico and Central America.

The Relation of Forests to Our Civilization

A Survey of Past and Present with a Prophecy for the Ethical Value of Forests

By Dr. Bernard E. Fernow,

Dean of Forest School, University of Toronto.

(Article reproduced from University of California Journal of Agriculture.)

In a volume entitled "Inquirendo Island," the author describes a community, descendants of a ship-wrecked crew, on a woodless island, iron being the only structural material and coal the fuel. While such an existence is thinkable, everybody who looks about him and realizes to what extent wood enters into our civilization will admit that such existence would be full of inconveniences. Indeed, our civilization is built on wood. From the cradle to the coffin we are surrounded by wood Next to food, wood is still the most needful material, although in many directions it has been supplanted by metal, stone, cement, etc. Yet even with all these substitutes, we are still pretty nearly correct in asserting that no article of civilized life, whether of food, shelter, clothing, of necessity, convenience or decoration, is produced or brought to the user without somewhere in the process relying on wood, be it only to furnish the mold or pattern or the handle of the tool with which it is shaped, or the package in which it is marketed.

It may be reasonably asserted that especially the beginnings of civilization would have been greatly hampered by the lack of wood; they are made most readily with wood. There are several intrinsic reasons for this: wood is the easiest material to shape, the simplest tools suffice to give it form. It is light, hence easy to transport, and, relatively to its weight, strong. It is most easily obtained and found, a natural product over a large part of the globe.

The phenomenally rapid development of our own country could hardly have been attained but for the vast forest resources which made it easy for the settler to build his houses and barns and to provide him with fuel. Even the rapid development of the forestless prairie became possible only through the ease with which wood materials could be transported in wooden cars over the wooden railway ties. The splendid wood supply of our country has also been largely responsible for the rapid industrial development during the first hundred years during which wood was one of the cheapest commodities.

Pulp and Printer's Ink.

Out of the many wood-using industries we might single out one which most strikingly exhibits the increased reliance on wood supplies. While in 1880 the consumption of pulpwood was almost nominal, less than three hundred thousand cords, twenty years later the consumption had grown to two million cords, and in ten years more this had more than doubled, and at present it has grown to around six million cords, attesting to a most remarkable growth in the consumption of paper in a particular direction, with the accompanying spread, let us hope, of intelligence due to the printed matter it has conveyed to the people.

The timber wealth of the United States has led in the past to extravagant use of wood to a per capita consumption which at one time exceeded 350 cubic feet, or eight times that of the German people and twenty times that of Great Britain, which latter country has to import practically all her wood materials and may therefore represent the minimum which modern civilization requires. This great timber wealth has been reduced to more than half its original greatness. The time for curtailing our lavish wood consumption has arrived.

Value of Substitutes.

But a few years ago we have begun passing through our second period as regards wood consumption; the "inexhaustible" supplies of natural woods having been in some cases and places nearly exhausted, prices having risen, and the substitution of other materials where possible having begun in earnest. Just now the Federal Trade Commission is trying to find out why news print paper has so advanced in price, indeed trebled in the last six years. The answer is easy. Raw supplies of spruce wood, the main staple for such paper, have been, within reasonable distance of transportation to the mills, reduced to such an extent that the end of the operation of many mills is in sight, and either the extent of the paper industry will have to be curtailed or substitutes be used. Railroad cars are being built of steel—an improvement over the less safe wooden car. Railroad ties are being at least impregnated with rot-resisting substances to make them last longer; while the superior steel tie is still awaiting adoption by American railways.

The development of the use of concrete seems almost providentially designed to fill the gap, as structural timber is getting scarcer. Brick and stone and steel or iron replace the wooden building materials, and in some respects, notably fire danger, we are thereby the gainers. Basketware, which in Europe is widely developed, will more and more become substitute for more solid packages. And so in many directions we see an adjustment to new conditions, a reduction in the use of wood setting in as our supplies are waning and wood prices are rising.

Presently we will pass into the third stage of development, when the mature virgin woods are practically cut out and the age of the forester—the timber farmer—has arrived, when human skill will be applied to secure wood crops, just as it is applied for securing food crops, when wood prices will soar and wood consumption will be reduced to the absolute necessity, as it is nearly so in England—when timberlands are managed and not any more exploited.

Then, also, another economic problem will call for simultaneous solution, the problem of the poor acres. For forestry is the art of utilizing non-agricultural lands, or those which by their topography, their physical condition or their lack of fertility withdraw themselves from farm use as plowland or pasture. More than half the natural forest area of the United States is now waste land, producing nothing of value, not even useful timber crops. The restoration of these lands to useful production will be the task of the foresters; and within less than a generation this reconstruction work will be quite generally undertaken in all parts of the country. That such recovery is not private, but communal work, and principally belongs to the State and preferably Federal Government agencies, is self-evident, largely on account of the long time which must elapse between expenditures and returns.

Future Problems.

With the increase of population more intensive use of all resources becomes necessary, and especially of those which through more intensive application of labor, knowledge and skill can be made to produce more fully. Intensive farming on farm lands will take the place of agricultural rapine, which is still extensively practised, and intensive forestry on forest lands will take the place of the present forest exploitation; from the same acreage the forester will produce five to ten times as much of useful material as Nature unaided could produce. A proper classification of lands and

their assignment to the best use will be the problem of the new era.

A third economic problem will at the same time find its solution: the re-establishment of a forest cover on hillsides and mountain slopes liable to erosion and unstable water conditions; for the absolute forest lands, those which are still fit for wood production, are mostly located where also the influence of forest cover on water flow and stability of soil is desired.

The importance of the influence of forest cover on cultural conditions has been in controversy ever since such influence was discovered. Generalizers on both sides have ridden the argument to the ground, when actually it can be used only for given specific conditions and localized environment.

There is, however, enough experience in the world to assure us that the retention of a forest cover on the slopes is in most cases favorable to stable soil and water conditions. The ideal civilized condition of a country will from many points of view, and always, be an alternation of forest and farm; even on the prairies this condition will be preferable to the open country under the constant sweep of winds. Here the climatic influence of the forest will be appreciated in full measure.

Lastly, we may not forget and not underrate the ethical influence which the forest has had in the past, has in the present, and will have in the future.

Who will question that the laborious work of hewing farms out of the virgin forest has bred a race of men of sturdier character, of more enterprise and self-reliance than the nomadic life of the plains and prairies could ever develop?

More and more the chances of these beneficial influences are reduced, as the virgin woods give way to the axe and fire. Much of the romantic wild-woods life will be lost as the economic principle is applied to the forest cover. Yet when the forester is in full action, a new beauty, the beauty of orderliness and usefulness, will attach to his plantations and natural regenerations. Even though his main aim will be an economical one, he may satisfy it without sacrificing the ethical one. At least the forester will be in all ages cognizant that the object of his care is an important factor in civilization, be it from the ecomonical, the environmental, the ethical point of view.

Developing the Forests of Japan

The forestry situation in Japan has been described by Mr. A. Nakai, a district forester from Tokio, in the following terms:—

"The total forest area of Japan, including Honshu, Skikoku, Kyushu, the Luchu islands, and other smaller islands, is 56,820,000 acres. The forests cover 78.3 per cent. of the total area of the Japanese islands. Of the 10,000,000 acres of forests in the principal islands of the group, two-thirds is in standing timber and the remainder is being reforested. The forests are classified into state, crown and private areas, and the timber is chiefly cedar, spruce, birch and Japanese pine, which is similar in appearance to the red and white pine of the United States and Canada, but of different physical characteristics. It requires about 100 years for forest trees to attain a diameter of 14 to 15 inches at a point about 5 feet above the ground surface.

"Japan exports more timber products than it imports. Korea, and parts of China and Europe, Australia, and the United Kingdom consume most of the lumber exported, although the United States takes large quantities of our oak. The large timbers used in Japan come from the Pacific north-west.

"Conservation methods work successfully in Japan and complete re-foresting of denuded areas can be accomplished in from 80 to 100 years. Re-foresting was commenced in Japan about 30 years ago, and the system is now complete.

"Patrol methods are followed in protecting Japanese forests from destruction by fire, a ranger's district covering from 5,000 to 6,000 acres. Volunteers fight the fires. When areas are cleared for re-foresting, lines of about 40 yards in width are left open and kept clear to prevent the spread of fires. In Japan there are seven major forest districts and within these are 205 subdivisions, all under comprehensive control. Areas may be cleared for farming, but in Japan the farm units are small, averaging only three acres for each farm.

"Taking the timbered areas of Japan, including the southern portion of Sakhalien, which is 90 per cent. timbered, Formosa and Korea into consideration, it will be observed that Japan has a very large forest area—estimated at 54,000,000 acres—in her colonies of Sakhalien, Formosa and Korea." '

Riordan Company to Plant Up Waste Lands

Plans for extensive planting up of cut over areas are being developed by the Riordan Pulp and Paper Company at St. Jovite, P.Q. Mr. A. C. Volkmar, Forester, is arranging for the placing of 400,000 plants next spring. During the present year 35,000 Norway Spruce and white pine plants were set out, and a beginning was made toward a forest nursery, about 100,000 plants having been developed from seed. Gradually, the nursery will be developed to an annual capacity of at least 1,000,000 plants of spruces and pines for use in replanting burnt and non-producing areas within the limits held by the company. Until the nursery is fuller grown most of the stock will be bought from the Quebec Government nurseries at Berthierville, and about 400,000 plants a year will be required.

The Laurentide Company and the Pejepscot Company have already developed forest nurseries of considerable proportions, and out-planting has been under way for several years.

THE START OF A FOREST FIRE, MONT ALTO STATE FOREST, PENNSYLVANIA.

VIEW TAKEN ABOUT 15 MINUTES LATER, SHOWING RAPID SPREAD OF THE FIRE, MONT ALTO STATE FOREST.

A FOREST FIRE IN THE ROCKY MOUNTAINS, ROSEBUD COUNTY, MONTANA.

ANNUAL SPRING "WOODS BURNING," LONGLEAF PINE, NEAR OCILLA, GEORGIA.

Growth of Canadian Forestry Association in Ten Months

List of New Members will Inspire Workers to Greatly Increase Association's Strength Before the Year Closes

The Canadian Forestry Association has grown by over 750 new members since January last. This very appreciable gain in strength would have been much greater had times been normal. The object of presenting the roll-call of new members in this issue is that our readers may learn which of their friends have responded to their nominations and which continue outside the membership. Here is an opportunity for urging upon two or three friends the worth-whileness of a permanent connection with the Canadian Forestry Association. There are but a few weeks before the year closes. It would be a fine stroke on the part of our members to build up the Seven Hundred to the edge of One Thousand. All you require is to obtain the consent of a friend to nominate him for membership. He will be added promptly, and in January next a memorandum of the annual fee of one dollar will be submitted to him.

Secretary, Canadian Forestry Association,
Booth Building, Ottawa:—

Make the fololwing a member of the Association, on the understanding that he will receive all publications and that in January, 1917, a memorandum of the annual fee of one dollar will be sent to him.

(Write very plainly) .....

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N. D. Johnston, Bristol, England.
Benson Johnston, Hamilton, Ont.
Arthur Jones, Smith's Falls, Ont.
J. P. Jones, Fort William, Ont.
C. F. Just, Petrograd, Russia.

K

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Robt. P. Kernan, Baie St. Paul, P.Q.
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George Kidd, Vancouver, B.C.
T. L. Kidner, Ottawa.
J. W. Killam, Montreal, P.Q.
Sydney King, St. Pacome, P.Q.
John W. King, Delisle, Sask.
King Bros., Ltd., Quebec.
Kingston Collegiate Institute, Kingston, Ont.
E. B. Knight, Meaford, Ont.

L

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Jos. Lagacé, Quebec.
Lake Superior Paper Company, Sault Ste. Marie, Ont.
Maxwell Langmuir, Toronto, Ont.
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J. P. Wright, Fort Frances, Ont.

Y

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Cyril T. Young, Toronto, Ont.

Z

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A Look-out in British Columbia.

The accompanying illustrations show the Huckleberry Hill Look-out, erected this year in the Lillooet forest district of British Columbia, and the outlook obtained therefrom, looking N. E. over Horse Lake.

While this Look-out is similar in character to many others in various parts of the Dominion, some details concerning it may be of interest. The railed platform is 8 feet square and 30 feet above the ground. The time occupied in construction was ten days, the work apart from hauling being carried out by two forest guards at a time when the low fire hazard permitted their transfer from patrol. The total cost, including the guards' time, hauling and supplies, was a few cents over $58.00, and is small in proportion to the assistance the look-out will afford in the protection against fire of the area controlled.

Lookout Tower, Huckleberry Hill, North Bonaparte Fire District, British Columbia.

Decreased Losses on B. C. Coast

In British Columbia Coast Forests.

1915 forest fire damage	$85,000
1916 forest fire damage	10,505
Merchantable timber killed in 1915	73 million feet
Merchantable timber killed in 1916	1,135,000 feet

Of these amounts, over one-half has been regarded as salvable.

Victoria, B.C., October 30th, 1916.

The fire season of 1916 has been an extraordinary one on the British Columbia coast. Until the last week of July the weather was particularly favorable, so that during July no fires occurred in the Vancouver and Island Forest districts. The expenditure for fire-fighting during May and June was about normal. Commencing about the end of July a long drought set in, which was not broken until October 25th, making about three months with hardly any rain. In these months logging debris became dangerously dry, and the hazard was intensified by dying vegetation in the woods and on cut-over areas.

The close season ended on September 15th, and many settlers set out clearing fires after the season, which in a few cases got out of control, although little actual damage was caused. The opening of the hunting season increased the human hazard very considerably, numerous fires in outlying districts being ascribed to that source.

At the end of the close season (Sept. 15) it was found inadvisable to dismiss all the patrol force, as conditions at that time were more hazardous than they had been at any previous time this year. Twelve or fifteen guards were kept on duty until Sept. 30th, and a smaller number until rain came on October 25th.

In September and October the spread of fires was checked by damp, cold nights, and also partly by heavy fogs. In green timber fires would not run to any serious extent, and were easily held in check by small fire-fighting forces. Logging slash was frequently set on fire by the unavoidable hazards incident to logging, and considerable areas were in several cases cleaned up without any damage to timber and equipment, although in other cases cut logs, logging equipment and camp buildings were destroyed.

The fire-fighting expense in Vancouver and Island districts was about $7,500, which is only half the amount spent in 1915.

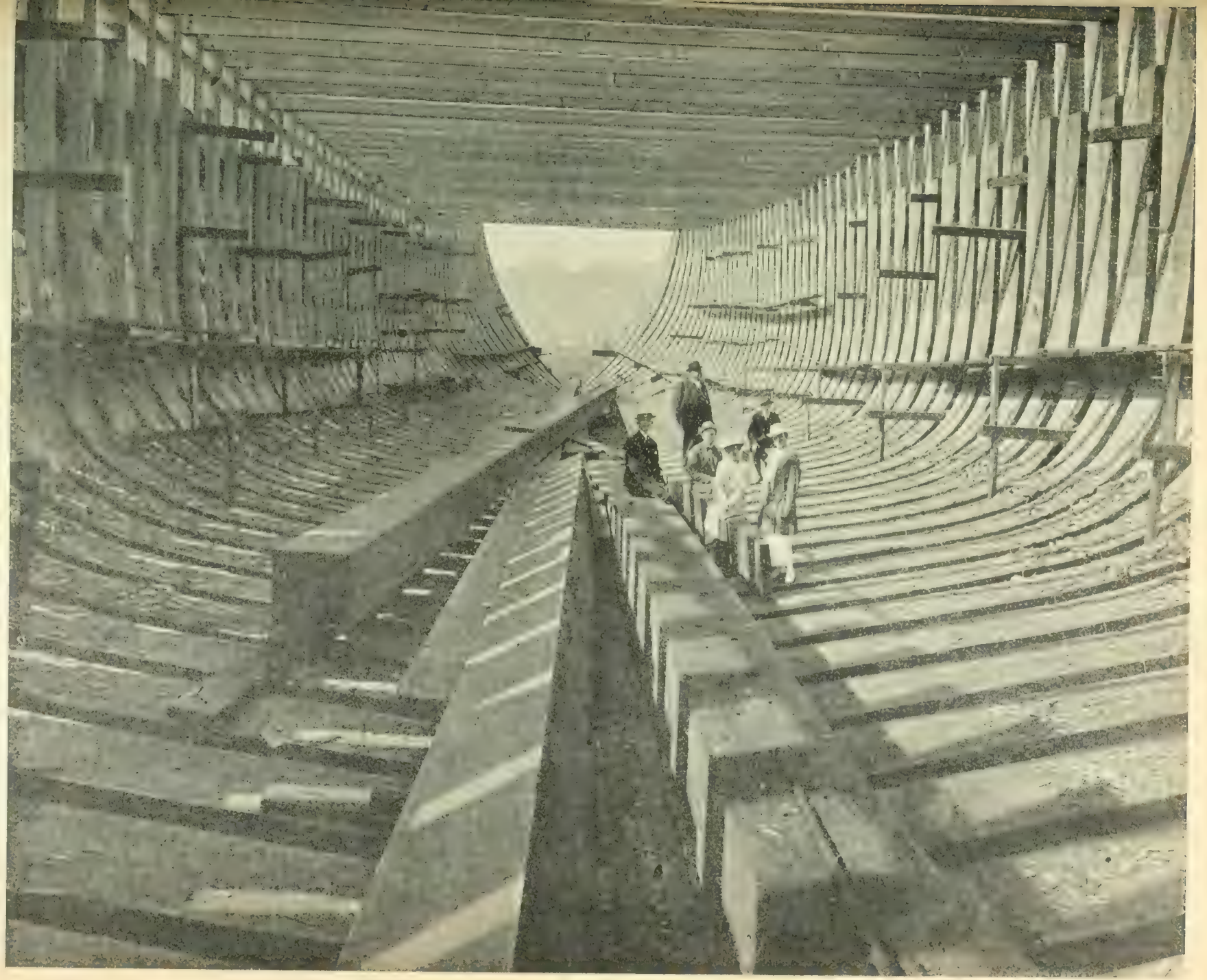
The area burned over this year in these two districts is 10,000 acres, compared with 140,729 acres in 1915. Included in the area burned this season is 300 acres merchantable timber and 8,648 acres logging slash, etc.

The damage done last year amounted to $85,000, so that this year's loss, amounting to $10,505, compares very favorably with the previous season.

In all, 1,135,000 feet of merchantable timber was killed on the British Columbia coast in 1916, of which about one-half will be logged without much loss. Last year 73 million feet were killed, of which about 43 million feet was reckoned to be salvable, being accessible for immediate logging.

Creation of B. C. Lumber Fleet: First of three vessels laid down at yard of Cameron-Genoa Mills, Shipbuilders, Songhees Reserve, Victoria, B.C.

The fleet is expected to partially solve the difficulties attending the export trade in lumber.



Unique view of Lumber schooner under construction. Inside the hull of "Mabel L. Brown," the first lumber schooner of its class being built in British Columbia. It is 225 feet long at the keel, 44 feet beam, and 22 feet deep, 265 feet in length over all.

(Courtesy "Industrial Canada.")

A Forest Travelogue—Free to Local Speakers

The fololwing is taken from the introduction of one of the Canadian Forestry Association's "Ready Prepared" Lectures which are being sent to local speakers in various parts of the Dominion.

The introductory section serves to bring the audience into sympathy with the subject—"Guarding the Forests." At its close the stereopticon throws upon the screen No. 1 of a set of 56 lantern slides. The manuscript in the local lecturer's hands contains descriptive paragraphs adapted closely to the pictures, which he proceeds to read.

A Nova Scotia school's superintendent wrote of one of these lectures: "The lecture was well received and apparently heartily enjoyed throughout. Our pupil-teachers who saw it should be able to do much to help along the conservation of forest land by their teaching next year. It is an excellent way to make impressive forest truths. I would be obliged if you would notify me when your new lectures are ready for the public."

An Introduction.

"I feel confident that the time devoted to our travelogue will make us better acquainted with a most interesting and benevolent friend, the Canadian Forest.

"We may have met him before in various guises, as the friend of the camper, the guardian of hunter and fisherman, the inspiration of painter and poet, but in our brief time together I would like to widen this acquaintance. I would like you to look upon the forests of Canada with more than a mere personal recognition, to regard them in their fuller utility as a *national possession*, building up a very considerable part of our commercial strength, co-operating with every constructive interest we have, and asking nothing in return for their multitude of benefactions.

Looking Over Canada.

Were we to take a journey by airship from coast to coast of Canada, there would be unfolded to our eyes a picture of our national possessions and activities, oddly inconsistent with some of the ideas we form as residents of town or countryside. Limited as our average outlook is apt to be, we reach conclusions colored a good deal by local conditions. Thus, if the question were put to us, individually, what are the biggest and most important activities of Canada, what answer would we make? Assuming that we should all agree on Agrictulture for the place of honor, what second choice would be forthcoming? Would not you or I who live, let us say, under the prestige of mighty steel industries in Nova Scotia, hazard an opinion that steel-making ranked with the first of Canada's interests? Or, hailing from a British Columbia town where salmon-packing occupied half the population, would not our sense of proportion expand on the side of the national fisheries? As we mounted mile high over the roofs of cities and farms, the chains of lakes and the dark matting of forests, how the merely local outlook would dissolve away! We would gaze upon a very old Canada, but with a new sense of proportion. Beneath our eyes would loom even larger than ever the immensity of Agriculture from Nova Scotia and New Brunswick through Quebec and Ontario and over the wide plains of the prairies. But the thought would clear the way for a true surprise. We would se manufacturing industries and fisheries and mining take their proper relation in the map of the nation's activities, and make humble obeisance to a mighty older brother—the great Canadian forests.

Nature's Plan for Canada.

No sooner have we satisfied ourselves of the vastness of the nation's forest riches than we indulge our speculations upon another point. What was Nature's scheme in shaping the soil of Canada so that more than half of our total area will profitably grow noth-

ing but trees? What purpose is served by this splendidly picturesque blanket of green? The answer is immediately at hand. Nova Scotia—and we select it only as an illustration—possesses great coal and iron mines. Not a ton of coal could be mined without timber to support walls and roof. If all the wooden mine props used in Nova Scotia in a single year were stretched end to end they would reach from Halifax to the coast of Ireland. Nova Scotia's fisheries could exist not a month without wooden boats, wooden barrels, and boxes, and buildings. The towns and villages look to the nearby forests for lumber, for fuel, for furniture. The farms must have timbers for buildings, and fence posts, and what is much more important, they must have neighboring forests to protect and nourish the crops. Exactly as in Nova Scotia, so we find the forest walking, hand in hand, with the farmers and townspeople of New Brunswick and Quebec and Ontario, upholding them in a thousand needs, catering to their comfort and adding richly to their pocket books. The lumbering and paper making industry of New Brunswick and Quebec and Ontario are of enormous proportions, employing the bulk of the 110,000 men who constitute Canada's wood-manufacturing army, and numbering fully 4,000 wood-using industries within their boundaries. You may sometimes think of the forest existing only in a northern wilderness, but as a matter of fact it is the foundation of every city and every farm. Though you have your house in the middle of a treeless plain in Southern Saskatchewan, the commercial forest *stands beside you.* It provides two hundred million dollars a year to purchase your wheat and live stock. It provides you a residence and barns and fence posts. It furnishes your house and keeps it warm. You could never have set foot on a railway coach for the West were it not for millions of tamarack and cedar and jack pine railway ties, wooden telegraph poles and wooden coaches. You could enjoy not one ton of coal from the Alberta and British Columbia coal fields were those mines unable to secure train loads of props to keep themselves in daily operation. Whatever the province, whatever the town or city or farming section, throughout Canada, there is no escape from the benevolence of the great forest riches that Nature provided in such abundance.

A Deforested Land.

On the other hand, one can scarcely overstate the condition of any province were it *stripped* of its forests through wholesale destruction by fire. A fuel situation would develop, the tragedy of which, in our wintry climate, we can scarce reckon. The greatest industry we have, that of wood manufacture, would fall to the ground. Our mines could not continue. Fisheries would be helpless under such a handicap. Fruit growing would give up every means of transportation. Many of our best streams, denuded of forest, would prove worse than useless as developers of light and power. Carriage factories and implement works depend upon wooden parts, and with scores of other industries could not long survive a stoppage of the supply. Indeed, one could enumerate with entire reasonableness and exactness our complete dependence upon what our forests do for us day by day, and the disastrous consequences to which the present pace of forest destruction is leading us. To some, such a gloomy picture might seem far-fetched, but we cannot run away from truth by that easy exit. The history of the stripped and ugly regions of north-western China, the once fertile and prosperous valleys of Palestine, large areas of Spain and Italy and Greece, point warning fingers to us as guardians of Canada, and bid us assure ourselves of a different fate while there is yet time.

An Important Move.

Hon. W. J. Roche, Minister of the Interior, has issued instructions that hereafter all homestead entries on Dominion lands of Western Canada will contain a proviso that settlers must take out a "permit" before setting out fires for the purpose of clearings lands. This places in the hands of the Dominion Forestry Branch a most necessary device for the prevention of fire losses in timbered country.

Mechanical Aids in Fire Fighting

The use of mechanical equipment for the extinguishing of forest fires is steadily gaining ground, with correspondingly good results in both efficiency and economy, says "Conservation." A recent development in this direction is the increased use by the Canadian Pacific Railway of tank cars for the protection from forest fires of the territory immediately adjacent to its lines.

This company, having previously secured excellent results from the use of tank cars on its lines in Maine, has now extended this method of protection to include a portion of the Muskoka district in Ontario. Two tank cars, comprising a single unit, have recently been placed at MacTier, Ontario, for use between Pickerel and Coldwater Junction, a distance of 116 miles. On one of these cars is a pump, and on the other a hose rack. Each car carries also a tank holding 7,000 gallons of water. The pump has a capacity of 400 gallons per minute. A total of 4,000 feet of 2.5 inch hose is supplied, so that fires may be reached at a considerable distance from the track, if necessary.

While the primary object of such equipment is the suppression of fires due to railway causes and the protection of company property, a great deal has actually been accomplished in the direction of controlling fires coming in from the outside.

Other Canadian lines making closely similar use of tank cars for fire-fighting purposes are the Grand Trunk, Temiskaming and Northern Ontario, and the Canadian Government Railways. It is reported that the use of one of the tank cars on the Temiskaming and Northern Ontario Railway during the great fire of July 29 and 30, was the direct means of saving the greater portion of the village of Porquis Junction from total destruction.—C. L.

$14,000,000 Saving to Nation Since 1910

Henry S. Graves, chief forester of the United States, who was in Denver recently on an inspection trip of Colorado and Wyoming, called attention to the splendid work of the forest service in cutting down the former enormous losses caused by forest fires. In round figures, the reduction since 1910 amounts to $14,000,000.

Mr. Graves drew comparisons by showing that in 1910, damage to timber on the public domain amounted to $15,000,000, whereas in 1914, in the North-West alone, 7,000 forest fires threatened the destruction of timber valued at $100,000,000, and the damages were held down to $300,000, owing to the alertness and efficiency of the Federal Foresters.

"The record of 1916 will excel the past in value of property preserved and in efficiency attained," Mr. Graves explained. "The principal work in connection with the administration of National Forest reserves is to protect from fire and to open up hitherto impenetrable forests with trails first and roads afterwards.

"In the past the average damage in normal seasons was not less than $10,000,000 per annum. In extraordinary years, it was greater."

Mr. Graves stated that 20,000 miles of forest trails have been built this year, and 20,000 miles of telephone wires have been strung, in addition to many other valuable and important improvements.

A Valuable Report.

The focussing of public attention in Canada upon the problem of strengthening our national organization through increased industrial and commercial efficiency lends special value and interest to the Seventh Annual Report of the Commission of Conservation which has recently been issued.

The résumé of the past year's work is notable primarily for the progress recorded in the constructive programme entered upon by the newly formed Town Planning branch, with respect to one of our greatest and most urgent national problems, viz., the proper use and development of land, particularly in urban areas.

A second noteworthy feature is the attention devoted by the Commission to the reduction of the heavy economic handicap imposed upon Canada through her enormous annual fire losses.

The section of the report containing the results of an agricultural survey in four representative counties presents accurate and definite data regarding the deficiencies of Canada's chief industry and affords a valuable indication of the lines along which efforts to improve rural conditions, economic and social, should be directed.

Steady progress has been made by the Commission in the huge task of national stock-taking, the urgent necessity for which becomes daily more apparent. Recent experience has served to emphasize the need for accurate knowledge of the nature and extent of the Dominion's wealth in lands, forests, minerals, water powers, fisheries and wild life, as a guidance to intelligent and permanent national expansion.

Insuring Timber Limits.

Standing timber is one fire risk that hitherto has not been regarded with favor by the fire insurance companies. Some insurance of this sort has been written in Canada by the London Lloyds on separate limited tracts and an excess loss only, the insured bearing all losses below this limit. The Phoenix Insurance Co., of London, is, however, this year writing some insurance upon green standing timber in Oregon and Washington, with certain restrictions, and at rates varying from 1 and 1½ per cent. The timber must be accessible to markets, not unduly exposed to fire hazard, and only one risk is taken in each fire zone or area indicated by the Company. No risk is written greater than $17,500 in any one such area.

W. R. Brown in an article on this subject in "American Forestry" goes in to some detail in discussing the possibilities of this subject. He summarizes the fire experiences within the territory of various fire prevention associations, and his figures include the 22,000,000 acres under the supervision of E. C. Allen in the twelve western private fire prevention associations which he supervises; the New Hampshire Timberland Owners' Association with 1,000,000 acres; the Northern Fire Protective Association of Michigan with 2,000,000 acres; the St. Maurice Valley Fire Protective Association of Quebec with an area of 8,000,000 acres—the total of the four associations being 33,000,000 acres. The expenditure for forest ranging and fire prevention is approximately 1 cent an acre for the first three and ¼ cent an acre for the Canadian organization. In the western associations the fire loss for the year 1910 was one-half of 1 per cent. In each association since that time it has been much less than that figure, except for 1914 in the Canadian association, when one fire got away and the fire loss of the year was three-fourths of 1 per cent upon the timber valuation. Taking all four areas together and summarizing the figures for each which Mr. Allen gives, the average yearly losses respectively were as follows:

1910, .005; 1911, .000171; 1912, .0002328; 1913, .0012636; 1914, .00253; 1915, .00427.

The writer concludes from these figures that in such protective areas fire insurance should cost for the loss ratio not over one-half per cent. annually, with another one-half per cent. added for administration cost of the insurance plan. He gives some further experience upon which to base this conclusion. In Minnesota during the last ten years, with its forest wealth of $280,000,000, the average fire loss has been about $100,000, or one-thirty-fourth of 1 per cent. annually.

Siamese Hardwoods.

In Siam the rosewoods are worked more particularly from the regions lying north-east and east of Bangkok, and are exported in the form of roughly trimmed round logs, the average size of which is 12 to 24 inches in circumference and 80 to 120 inches in length. The rosewood forests have been heavily over-exploited, and as the Siamese government is now taking measures to protect this wood by requiring workers to take out permits and by fixing a minimum girth at which it may be felled, restriction in general output is likely to ensue. The ebony woods are found to the west of Bangkok in the district of Kanburi, Petchaburi, and to the south toward the Malay penisula. They also are exported in the form of roughly trimmed logs 12 to 20 inches in circumference and 80 to 120 inches in length.

The exploitation of these woods is not a regular industry in Siam, but forms one of the desultory occupations of the people when they are not engaged in rice growing. The wood is bought by Chinese, who are either middlemen or agents of Bangkok Chinese firms, and, as it will not float, it is brought to Bangkok by boat or by train. It is sold by weight, the unit for export being usually 100 piculs (about 6 tons), and the average price in Bangkok ranges from £22 10s ($109.50) to £37 10s ($182.50) for rosewoods and about £22 10s per 100 piculs for the ebonies. The ebonies are apparently more uniform in quality than the rosewoods. None of these woods appear to be dealt with in Bangkok in the sawn form.

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Pine Trees of Finland.

The pine trees of Finland are the gold mines of the country, and really its chief trade. Pines and silver birches flourish on all sides. Everything or anything can apparently be made of birch bark in Finland; shoes, baskets, large or small, salt bottles, flower vases, even an entire suit of clothing is hanging up in Helsingfors Museum, manufactured from the bark of the silver birch.

The lakes of Finland, of which there

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are five or six thousand, cover about one-sixth of the country, but these lakes, rivers, and waterways all take their share in the wood trade. In the autumn the trees are felled and left for the first fall of snow. The timber is conveyed to the nearest waterway, where it is stamped with the owner's registered mark and rolled upon the ice of lake or river to await the natural transport of spring. On they voyage, these soldiers of the forest, for hundreds of miles to the coast, till finally, arriving at such an enormous wood export station as Kotka.

Forest Fires and Fire Prevention.

(Kitchener, Ont., Record.)

That Canada's losses through forest fires in 1916 total $9,000,000 is a statement which has been repeatedly made in the public prints. It seems incredible, yet when it is recalled that 1,200 square miles of timbered land in Northern Ontario was burned over last summer, the figure at which the losses is placed may not be a whit too high.

Government and people, when reports of the losses of life and resources in the Northern Ontario conflagration of 1916 came in, exclaimed, "Oh! Dear! Dear!" And afterwards apparently treated the matter as a visitation of Providence. Not so, however, the Canadian Forestry Association of Canada. It looked for causes and discovered that forest fires generally are preventable to a large extent. It recommends a reorganization of the fire-ranging organization, with particular attention to the timber lands of the Crown and the enactment of legislation which would prevent settlers starting brush or clearing fires without the authority and the personal supervision of government officials.

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The following books are suggestions. They are worthy of your inspection. Send for copies to-day, and be prepared to meet the various daily problems.

FOREST VALUATION
By Professor H. H. Chapman, Yale University.
A valuable book for those not already familiar with the economic and mathematical principles on which the theory of forest finance is based.
283 pages, 6x9. Cloth, $2.00 net.

ELEMENTS OF FORESTRY
By Professors F. F. Moon and Nelson C. Brown, N. Y. State College of Forestry at Syracuse.
Covers, in an elementary manner, the general subject of forestry.
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LOGGING
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Covers the more important features of operation. Discusses at length the chief facilities and methods for the movement of timber from the stump to the manufacturing plant, especially logging railroads.
590 pages, 6x9, illustrated. Cloth, $3.50 net.

MECHANICAL PROPERTIES OF WOOD
By Professor Samuel Record, Yale University.
This volume includes a discussion of the factors affecting the mechanical properties and methods of timber testing.
165 pages. 6x9. illustrated. Cloth, $1.75 net.

THE PRINCIPLES OF HANDLING WOODLANDS.
By Henry Solon Graves, The Forester, U. S. Department of Agriculture.
Contains chapters on The Selection System, The Coppice Systems, Improvement of the Forest.
325 pages, 5¼x8, illustrated. Cloth, $1.50 net.

THE THEORY AND PRACTICE OF WORKING PLANS (Forest Organization)
By Professor A. B. Recknagel, Cornell University.
In preparing this book the author has constantly kept in mind the experience which he gained while doing active work for the Forest Service in various parts of the United States.
235 pages, 6x9, illustrated. Cloth, $2.00 net.

CANADIAN FORESTRY JOURNAL,
119 Booth Building, Ottawa.

The third member of the British Columbia Forest Service to be awarded the Military Cross is Lieut. Edwin A. Ketteringham, of the Norfolk Regt., formerly a sergeant in the Canadian Cyclist Corps, who at the outbreak of hostilities was clerk in the Cranbrook district office. The official records state that "he entered the enemy's trenches, gathered useful information, inflicted considerable loss, and brought back a wounded man under fire."

Corporal A. Reece, of the machine gun section, 16th Battalion Canadian Scottish, recently awarded the Military Cross, has since died of wounds received in action. Both he and his elder brother were members of the field staff of the Provincial Forest Service, and enlisted for active service in the same battalion.

Pte. A. G. Malcolm, another member of the field staff, has been wounded for the second time, while serving with the 48th Battalion 3rd Canadian Pioneers.

Capt. John Brine Mitchell, 8th London Regiment, Deputy District Forester of the Vancouver district, Rhodes scholar, holder of the Military Cross, a forester of the greatest promise, and a man whose friendship was deeply cherished by his associates, was killed in action on Sept. 15th, "somewhere in France."

Captain R. A. Spencer, of No. 1 Tunnelling Company, who in civil life is on the staff of the Forest Products Laboratories in Montreal, has won promotion and the Military Cross. How he earned the distinguishing decoration is told in brief but expressive terms in the official order. It says:

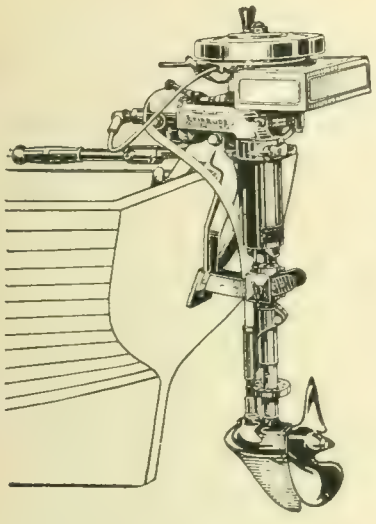
"During five successive nights he patrolled 'No Man's Land' in order to locate a mine gallery, and then wrecked it."

Keeping the Iron Hot.

The following editorial appeared in "Industrial Canada," official organ of the Canadian Manufacturers' Association:

"It is a good thing that we have a Forestry Association in Canada to keep alive the agitation for better forest protection. Already the alarm and indignation aroused by last summer's holocaust in Northern Ontario are dying down. The event has become historical. It has passed from the immediately impressive to the remotely observable. Unless the effect of the tragedy can be made to live in men's minds until the Legislature is compelled by the strength of public opinion to do something drastic to prevent a recurrence of the catastrophe it will be a national misfortune. The Forestry Association is valiantly doing its part to preserve the impression made immediately after news of the fire was flashed across the country.

The latest reminder from the Association takes the form of an expression of opinion by various experts on the value of the permit plan of controlling settlers' fires. The conclusions arrived at are impressive and are well worth emphasizing in these columns."



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AFTER THE WAR—AN AMERICAN OPINION.

Readers of the Journal who have followed the discussion of post-bellum tariff arrangements in the lumber trade may be interested in the following discussion in the "Timberman" of Portland, Oregon.

"The question of an imperial preference on Canadian lumber entering Great Britain and her dependencies, was the subject of a conference at Victoria in September, before the Dominion's Royal Commission.

"The principal evidence relating to the British Columbia export lumber trade was given by H. R. MacMillan, former chief forester, who maintained that, if Great Britain would lend to the province some of her ability and experience of methods of transportation and brokerage and generally co-ordinate with the efforts being put forward in this part of the Dominion on behalf of the timber industry to a greater extent, British Columbia would be able to hold her own against all competitors.

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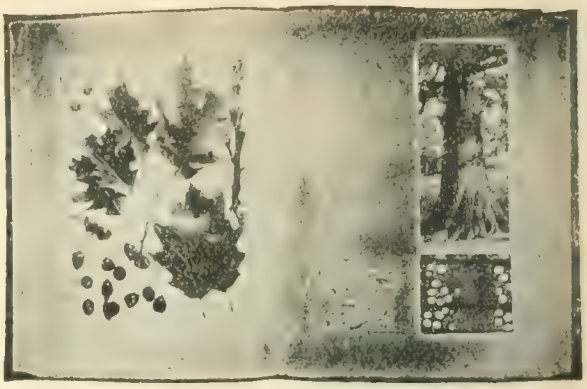
two officials of the committee, Messrs. E. J. Harding and A.H. Bridgman,were met at Vancouver by Sir Robert Sinclair, of New Zealand, and Sir John William Langerman, at the close of the conference. At the present time the allied powers have been discussing the question of closer trade relations after the war. This idea springs from the antagonism to the Central Powers. Whether, when the war is over and commence is relieved from the straight jacket tension in which it is now en compassed, this feeling will be as dominant is another question. The nations are war-mad. The arbitrament of the sword as a means of settling territorial expansion and changing political policies may be essentially ethical, but when it comes to dealing with the laws of commerce, which are grounded on the basic principle of buying in the cheapest market and selling in the dearest, the problem is essentially different. Service and price go hand in hand with the law of supply and demand. If any nation can make an article which is better adapted to the service to which it was designed than that of another, in the end it will be adopted. This is inevitable. At the present time the whole business world is in a chaotic condition. The United States' lumbermen are clamorous for a protective duty against Canadian lumber and shingles, the British Columbia lumber interests are petitioning for an imperial preference. The republic of Chile has increased its lumber tariff New Zealand's state-owned railroads impose a higher rate on foreign woods moving on its lines than that of native manufacture. In the meantime the export lumber interests of the Pacific Coast have wisely decided to form an export company which has for its object the securing of a better price for its foreign market. It is quite reasonable foreign market. It is quite reasonable to suppose that the lumber interests of British Columbia will form a similar selling organization. At the present time the British Columbia mills are securing from the British Government a price of $12 for Douglas fir ties, which have been purchased from American mills at $9. This is an example of discrimination, blended with an earnest desire for national unity due to the stress of war."



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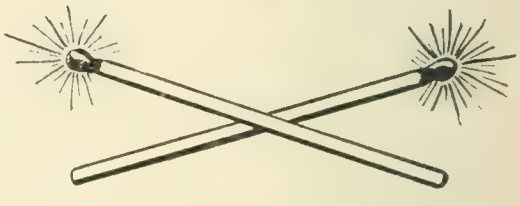

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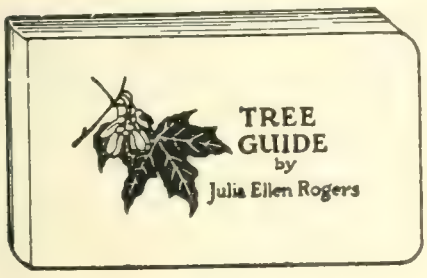

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BOOK DEPARTMENT, CANADIAN FORESTRY JOURNAL

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Stimulating Growth of Ornamental Trees

It should be the aim of every woodlot owner to keep the crowns or tops of the trees over the whole area touching each other in such a way that the ground below the trees is kept shaded. This prevents the growth of grass and weeds, and permits seedling trees to establish themselves. Once the ground becomes well covered with small seedlings, opening up the crown by the removal of a few of the old trees and letting in the light will be beneficial and encourage rapid growth. Old, over-mature, spreading trees which prevent the proper development of younger trees coming up beneath them should be removed. As a rule, however, it is not advisable to make an opening in the tops or crown cover which will not be filled in again in three or four years either by the spreading of the surrounding trees or the development of younger ones that are coming in below.

One of the best methods of stimulating the growth of shade and ornamental trees is to improve the physical condition of the soil beneath them. For a radius of two or three feet about the stem the soil should be kept cultivated. The air is thus permitted to reach the roots, and at the same time rapid evaporation of moisture is prevented.

Where the decline of trees is caused by a deficiency of nutritive elements in the soil the condition can be improved by mulching with manure in the fall. This should be allowed to remain all winter, and in the spring should be turned under. It will not only enrich the soil but improve its physical condition. An occasional dressing with hardwood ashes is to be recommended, and will often be found to be all that is required in the way of fertilizer. Ten pounds to the hundred square feet should be sufficient.

There are several chemical fertilizers which can be used instead of manure for improving the soil. One of the best is the following mixture, which should be applied to the soil early in the spring:

1 lb. of nitrate of soda,
5 lbs. of cottonseed meal,
2 lbs. of acid phosphate,
2 lbs. of muriate of potash,

the whole to be mixed before spreading. One pound will suffice for one hundred square feet.

Boy Scout Forestry Test.

To meet Canadian conditions, the Dominion Council of the Boy Scouts' Association has authorized a Forestry badge, in lieu of the Woodman badge. The conditions under which this badge may be secured by the boys are very comprehensive, and will do much to interest Canadian boys in the Canadian forests and the wild life found therein. are:

The scout must—

1. Identify the principal tree species in own locality, and explain their principal distinguishing characteristics.

2. Identify five kinds of shrubs.

3. Describe the principal uses of ten species of Canadian woods. Visit a wood-using factory, if practicable.

4. Explain the aim of forestry, and compare with agriculture and unregulated lumbering.

5. Tell what are the effects of fires on soil, young forest growth and mature timber; principal causes of forest fires and how best to overcome them; three general classes of forest fires, and how to fight each.

6. Describe how the forest lands are protected and administered in own province.

7. Describe the general features of a lumbering or pulpwood operation; how the cutting is done in the woods; method of transportation to the mill, and of manufacture there. Visit some portion of woods operation, or sawmill, or pulp or paper mill, if practicable.

8. (Optional.) Discuss one or more of the enemies of trees, such as insects (leaf-eaters, bark-borers, wood-borers), or decay (fungus diseases), and tell something of how damage from these sources may be lessened or overcome.

Northern Ontario Fire Losses

Reports to the fire marshal's office from northern Ontario fire are now closed, and after a thorough survey of the territory, the following figures were given by provincial fire marshal E. P. Heaton, as the official record of the loss to created property:—

In all, 849 people have suffered loss, some having more than one property involved, but no effort has been made to ascertain the total number of buildings destroyed.

The aggregate loss sustained reaches total of $2,134,349. The insurance recovered or claimed upon licensed and unlicensed companies is $1,045,585, and the loss sustained by the people in excess of insurance is $1,088,764. About 50 per cent. of the actual loss on property is covered by insurance.

No provision is made for loss on standing timber, but included are pulpwood cut, stacked and ready for delivery.

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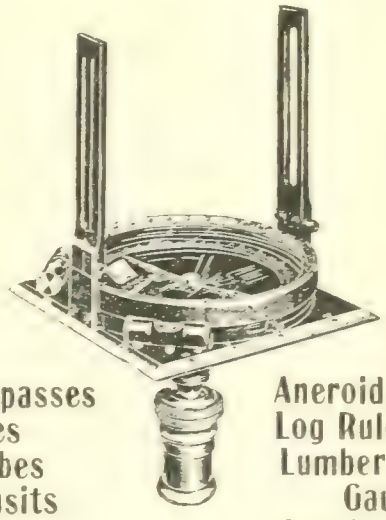

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Of the claims upon insurance companies $654,922 is borne by the regular licensed companies, and $390,663 by unlicensed insurance companies. Of the latter, at this date, practically all has been paid, or will shortly be paid, with the exception of $28,200. This amount represents claims upon a number of small unlicensed companies, the payment of which is not yet due. All, however, is due, and should be paid before the end of this month, and the fire marshal will then be in a better position to know what, if any, is to be the extent of the default in payment et the unlicensed companies.

At Cochrane 203 people had a total loss of about $960,000, with $525,000 of insurance.

At Matheson, 51 people had an amount of $126,000; the total insurance was only $12,800.

At Iroquois Falls, which includes the loss of the Abitibi Power and Paper Company and their tenants, the loss was distributed among 31 people, with a valuation of $316,000, and an insurance of $289,000.

Pulpwood, not including the Abitibi Power and Paper Company, cut and ready for delivery, is represented by a total of $63,000, which carried insurance of $43,000.

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The Association prepares and places through its Publicity Department, many hundreds of special articles every year, reaching the Canadian Public through daily and weekly newspapers, weekly and monthly magazines, including agricultural, financial, religious, literary, engineering, juvenile, and practically all divisions of Canadian journalism.

Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

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These are a few of the concerns of the Canadian Forestry Association.

Support is entirely from voluntary sources. The Association is not identified with any Government or special interest whatever.

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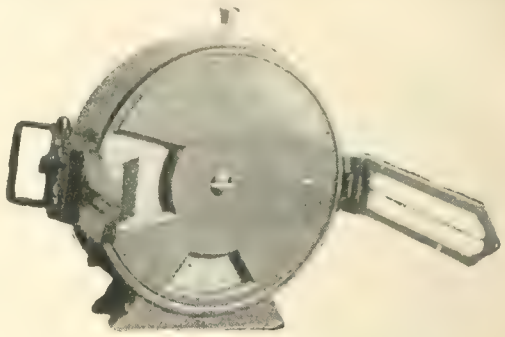

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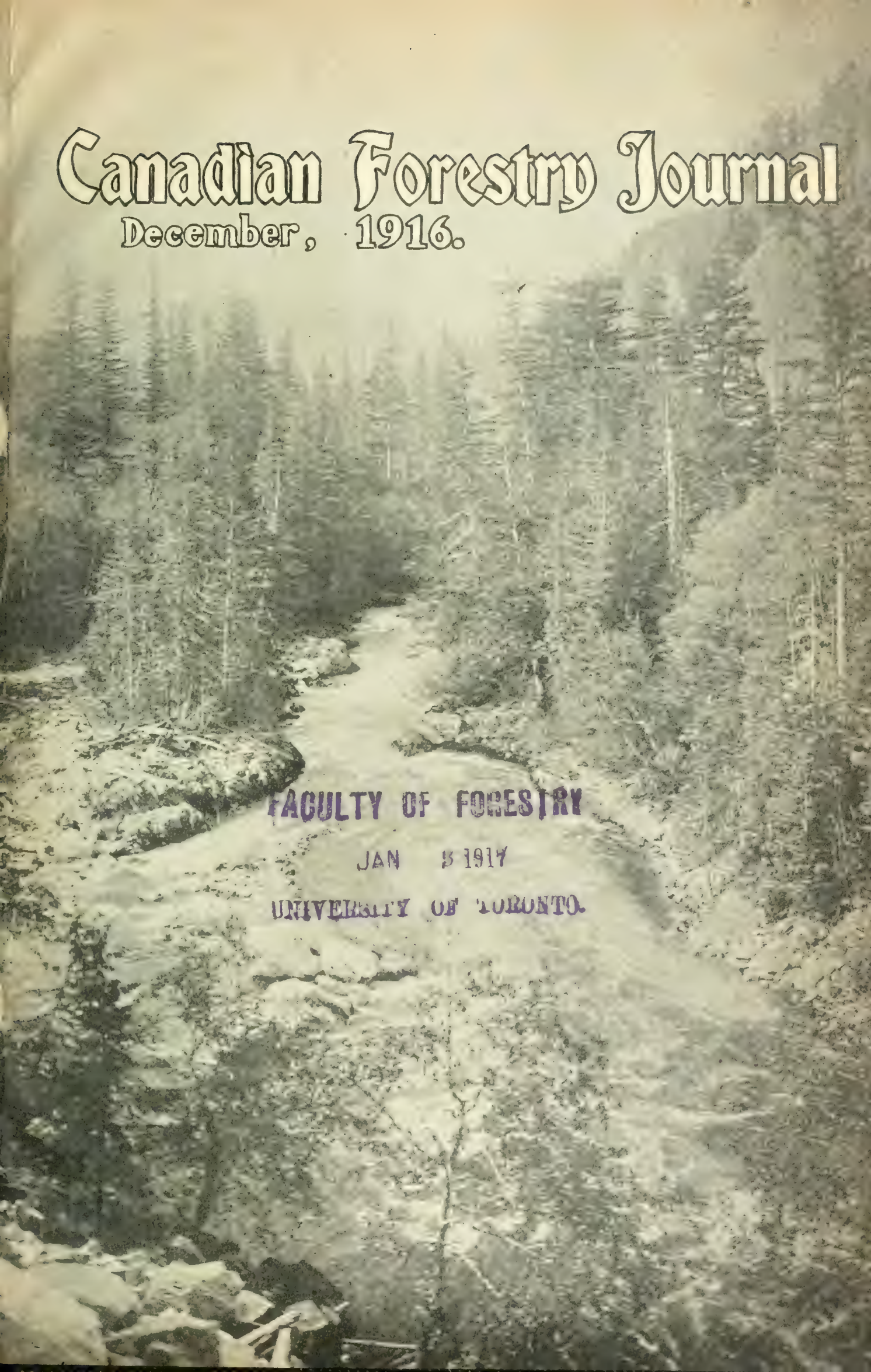
December, 1916.



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Canadian Forestry Journal

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The CANADIAN FORESTRY ASSOCIATION,
119 BOOTH BUILDING OTTAWA.

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A PRACTICAL LESSON IN FOREST DESTRUCTION.

These precipitous mountain slopes near the Austro-Italian international boundary line were once covered with a forest growth. Their present appearance evidences the destructive work of the past, the present lack of water and the parching heat of the sun.

THE ABUSE AND RIGHT USE OF LAND.

Along the coast of Lake Garda, which is crossed by the Austro-Italian international boundary line, are found extremely productive and intensively managed lemon and olive groves, and bordering them at higher elevations are some of the most sterile mountain slopes in the civilized world.

VALLEY OF THE ADIGE AT TRIENT.

This is a portion of the land Italy hopes to regain from Austria. Throughout the entire region the valleys are narrow and fertile, the mountains high and rugged, and their slopes steep, sterile and denuded of the forest growth that once covered the now exposed diorite rocks.

AREAS OF DESOLATION CROWNED WITH A CASTLE.

Steep slopes of exposed rock originally forested, but now covered with an open growth of inferior trees and shrubs. A thousand years ago the building crowning the height was a fortified castle, later it was converted into a monastery, and now it is used by the Austrian army operating south through Tyrol.

A Ranger School in Operation

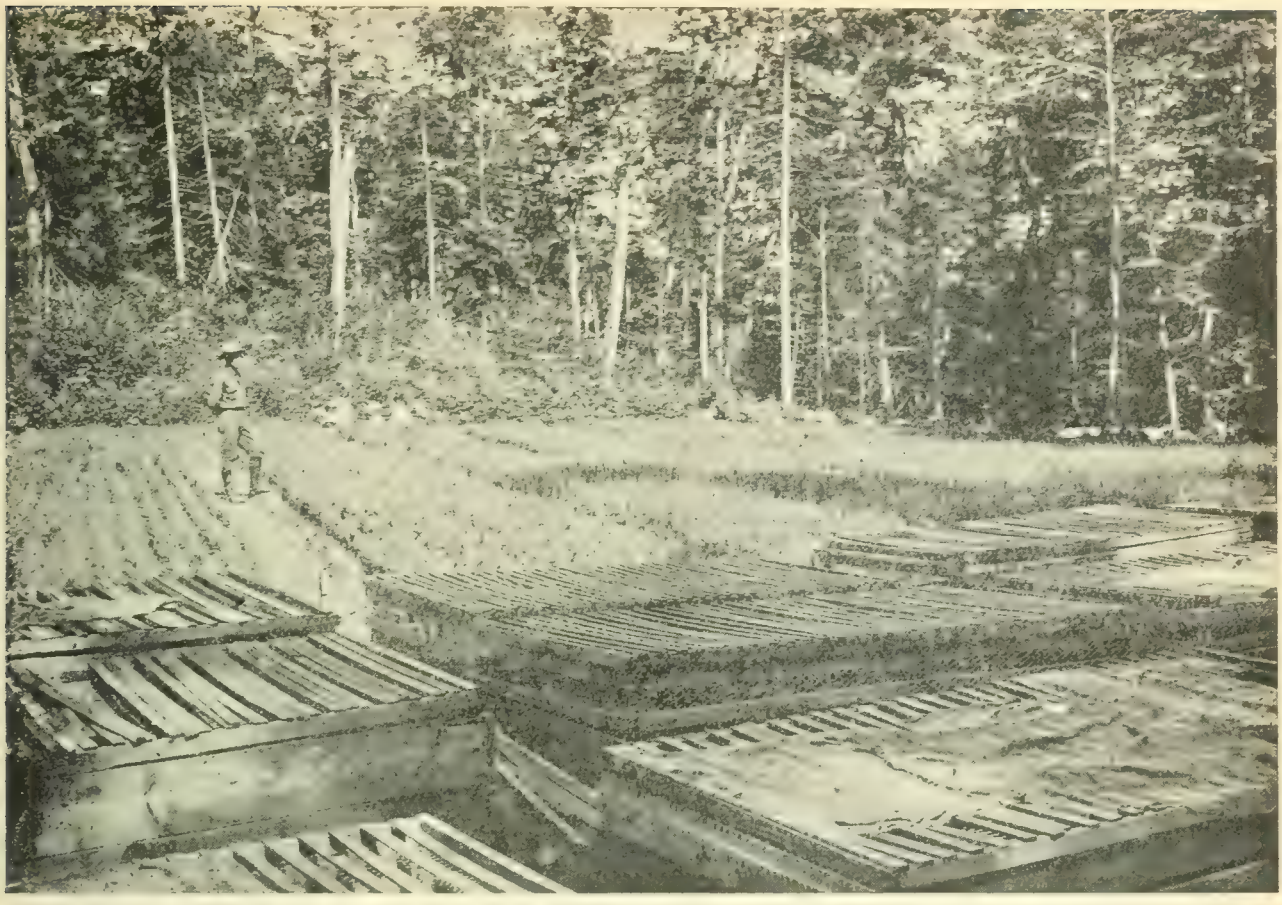
Training Men By Short Courses for Fire Protection, Tree Planting, Estate Management, An Example for Canada

That the best results from the employment of forest rangers cannot be reached until the political patronage system of appointment is eliminated has long been recognized. There is a further necessity in any effective, and hence economical, plan of forest guarding: the training of the rangers. In the European systems, courses are provided for those who, without intending to qualify as forest engineers, desire proficiency in the secondary duties of the forest service. The idea has been adapted in America in the Ranger School, with amplifications to meet special conditions. In the following article, prepared at the request of the Canadian Forestry Journal, Mr. S. D. Smith, Director of the State Ranger School at Wanakena, New York, discusses the work of the institution. With the improvements taking place in the various provincial and federal forest services of Canada, a Ranger School established in Ontario, Quebec, New Brunswick, British Columbia, and at a point to serve the prairie provinces, would seem a sterling undertaking on the part of the governments responsible for protective work.

Objects of the School.

The primary object of the State Ranger School, maintained by the New York State College of Forestry, is to give young men thorough practical training which will enable them to take up work in Forestry and its associated callings such as managers of private forests, forest guards or rangers, and specialists in planting and growing young trees. This is not inclusive of

THE RANGER SCHOOL GROUNDS FROM THE OSWEGATCHIE RIVER.



The teachings of the class room are supplemented by actual field practice. In this nursery the stock is grown for planting on the College Forest. Approximately 50,000 young trees are planted annually by the Students.

the various positions with large lumber companies and pulp and paper concerns as timber cruisers an din map making and surveying.

No man can be a good forester in the broadest sense of the term who cannot take care of himself in the woods, and as a large part of the regular instruction of the School, field trips, and excursions are planned to enable the men to develop all that is possible of ingenuity and responsibility in providing proper food and accommodations for themselves when at considerable distance from their base of supplies. But this field work is in no sense a vacation. It is just as essential as the instruction in the class-room and frequently is of several weeks' duration.

Any young man of good moral character and in sound physical condition over nineteen years of age is eligible for admission to the School. Every effort is made to exclude from the School all those whose tendencies or characteristics would retard their development or would injure the well-being of the student body. Every student is taken on probation for one month, since it has been proven unwise to carry a students whose inclinations and ambitions are not in accord with the School. It is obviously unfair to a young man to continue him in the school work when it is clearly proven that the profession holds nothing for him.

A Short Course in Forestry.

Although several of the larger universities have graduated men as professional foresters, there is yet quite a field between the lumbermen and the professional foresters, and it is this field that the Ranger School is endeavoring to fill. ,Many of the young men of this and neighboring states could not see their way clear to enter the regular university four-year course, nor could they obtain the help they needed from text-books or treatises on the subject, and this class of young men have been very eager to secure the benefits of this short course in Forestry.

The school is located at Wanakena,

N.Y., in the Western Adirondacks, where opportunity is provided for demonstration and field work in surveying, mapping, and timber estimating. In this vicinity several large tracts are being lumbered at the present time, and the students are privileged to visit and study the lumber camps and the mills of the pulp and paper companies. Through the generosity of the Rich Lumber Company the school owns and maintains its own forest, consisting of approximately 1,800 acres. Adjoining this on one side is a State forest of virgin timber of several thousand acres, which also offers excellent opportunities for the demonstration of the principles of Forestry.

For Comfort of Students.

Good warm buildings are provided for the accommodation of the students. The main building consists of an office, class-room and recreation room on the first floor and dormitories on the second and third floors. The dining hall is also neat and well equipped. Both buildings are provided with running hot and cold water. Equipment in the way of tools and instruments are furnished for demonstration and actual use of the students in surveying, estimating and accurate mapping.

The location of the school on the inlet to Cranberry Lake makes transportation by water often necessary, and for this purpose motor boats and canoes are maintained by the school.

Lumbermen Co-operate.

The school does not guarantee positions to its graduates, but all assistance possible is given by the school in locating its graduates in positions which offer opportunity for advancement. The school does not furnish a complete education in forestry; but the courses given will fit a man for general practical forestry work and give him a thorough practical working knowledge of the subject. The aim is to make the course practical, avoiding so far as possible the purely theoretical part. It is worthy of note that the lumbermen who at one time gave little credit to this work are now much interested in it, and are glad to detail special problems in their operations for solution by the students of the Ranger School. The practicability of the school is doubtless what appeals to them and explains why its graduates are so satisfactory in the service of these men.

Lieut. George E. Bothwell Killed

Lieut. George E. Bothwell, of the Forestry Branch of the Department of the Interior, who enlisted in the 51st Battalion of Edmonton, has, according to unofficial reports received, been killed at the front. Mr. Bothwell enlisted as a private and worked his way up to a commission, and crossed to the front in France in the summer of 1916. After the advance of the British forces on the 15th September Mr. Bothwell was officially reported "missing," but no further word could be obtained as to his fate until his father, who lives in Perth, Ontario, received a letter from one of the other officers of his company giving details of what happened. It appears that the British troops had made a victorious advance and captured the enemies' trenches, and that Mr. Bothwell's company had rounded up a number of prisoners who had surrendered in a dug-out. Apparently the prisoners had not been fully disarmed, for when Mr. Bothwell's back was turned one of them suddenly drew a revolver and shot him in the back of the head, killing him instantly. It is very regrettable indeed to lose a promising young forester like Mr. Bothwell, and particularly as a result of such a treacherous act.

Mr. Bothwell was employed at the head office of the Forestry Branch for a short time, and while there prepared a bulletin on Co-operative Forest Fire Protection, which described the work of the forest protective associations formed by the lumbermen, particularly in the St. Maurice Valley. He afterwards worked as assistant on the Athabaska division of the Rocky Mountain Forest Reserve, and gave promise of being a very useful field officer.

Ontario Adopts a Forward Policy

Government Announces Reorganization of the Forest Protective Service, Under New Department, and Control of Settlers' Fires

Reorganization of the forest protection service of the Province of Ontario has been decided upon by Hon. G. H. Ferguson, Minister of Lands, Forests and Mines. Announcement of his plans was made before a delegation organized by the Canadian Forestry Association which discussed the subject with the Minister at Toronto on Tuesday, November 28th.

The announcement, far from being a "promise to consider," gave a specific outline of reorganization to which the Government is pledged to adhere. Edmund J. Zavitz, Provincial Forester, is appointed head of a new forest protection department which includes, as well, all work relating to forestry. The Minister gave assurance that the new department, which will be under his own general supervision, will be given every facility to work out a comprehensive and effective system. The matter of additional appropriations, he said, could be arranged without difficulty.

To Take Care of Settlers.

Under the new forest protection chief, there will be developed a scheme of issuing "permits" for the burning of settlers' slash, which the Department recognizes as the great source of dangerous forest fires. Under the system proposed, settlers will be allowed to burn off their debris only under proper weather conditions and by personal direction of a fire ranger. There will also be worked out a plan for applying to forested country such modern improvements for fire detection as lookout towers, telephone lines, trails, and other equipment. In presenting this excellent programme, the Minister clearly emphasized that his decisions were the result of much consideration and the study of protective systems in other parts of the country. His public announcement had been withheld until the deputation could appear before him and present its views. It was his intention to have Mr. Zavitz proceed with the new work without delay so that the season of 1917 would witness part at least of the new plans in effect.

Mr. Ferguson said that his department had not been slumbering in forest protection duties, but had employed in some seasons 1,000 rangers. Within the Reserves, permanent improvements had been carried on on an extensive scale. Reforestation had been taken up, and in many parts of the province old limits were being cared for with a view to their future value. The patrolling of the Claybelt country, in particular, was a difficult proposition, for the influx of settlers in recent years had developed special problems of fire control.

Faults of Present System.

The delegation which the Canadian Forestry Association brought before the Minister to talk over the forest protection problem was an uncommonly strong and representative body of men. Lieut.-Col. J. B. Miller, President of the Association, briefly introduced the subject of the interview and called upon the Secretary, Mr. Robson Black, to read a memorandum. The latter document contained a detailed criticism of present organization of the forest service of Ontario on both licensed and unlicensed lands, the absence of skilled management of rangers, the lack of inspection and consequent poor results. The need of a settlers' permit law and the construction of fire detection and fire fighting aids, such as telephones, trails, etc., was plainly discussed.

Pointed Evidence.

Brief comments were made by most of the members of the deputation, all expressing confidence in the Minister's intentions to place Ontario's forest service in the front rank of Canadian provinces. Mr. Ellwood Wilson, President of the St. Maurice Forest Protective Association of Quebec, gave a succinct outline of the results obtained from the use of modern protective methods. The application of a settlers' permit law did not alienate the settler, as some might anticipate. Tactful education was a sufficient weapon to overcome prejudice, and the threat of legal penalties sufficed for the few recalcitrants. Mr. Frank Hawkins, as Secretary of the Lower Ottawa Forest Protective Association, gave the Minister a valuable resumé of the success in combatting fire during 1916. Sir Edmund Walker, President of the Canadian Bank of Commerce; Mr. W. E. Bigwood, President of the Canadian Lumbermen's Association; Mr. James White, Deputy Head of the Commission of Conservation; Mr. Parsons, Vice-President of the Canadian Manufacturers' Association; Mr. T. H. Hall, representing the Canadian Fire Underwriters' Association; Mr. Arthur Hewitt, President of the Toronto Board of Trade; Mr. James Simpson, representing labor unions of woodworkers; Mr. Cyril T. Young, of the Canadian Northern Railway; J. G. Elliott, President of the Canadian Press Association; C. M. Auer, representing Porcupine mining interests, and the township of Tisdale and town of Timmins in Northern Ontario, presented very helpful comments. The latter speaker frankly told the Minister that the fire hazard had been greatly increased by the 1916 conflagrations, and that the population could not be held in the country if prompt protective measures were not taken.

The Association's Part.

The introduction and conclusion of the Canadian Forestry Association's memorandum were as follows, (the body of the document containing detailed observations of the Ontario system being omitted here for lack of space.)

"The part played by the Canadian Forestry Association in relation to the Ontario forest protection system has had as its object the educating of public opinion upon the value of the forest possessions and the wisdom of guarding them against the waste of fire. Such questions as the extent of forest fire losses, the dependence of forest industries upon accessible and abundant supplies, the profitable results of modern patrol systems, the common-sense of the 'permit plan' for controlling settlers' clearing fires all required discussion and in affording the means for this we aimed to bring the people to intelligent conclusions as to their existing forest laws and administration.

"The effect of the educational campaigns has been to stimulate public conviction and to provide necessary support for this Government in adopting an advanced policy. We come before you to-day not to emphasize what we believe are the shortcomings of the system which has been inherited from previous Governments, but to assure the Minister of Lands, Forests and Mines of our full confidence in his desire to give Ontario the most useful plan of forest protection that can be devised. We congratulate him upon the investigations he has set in motion for the securing of full information, and do not doubt that the new basis of organization for forest protection purposes will bring the province of Ontario within reasonable reach of its great responsibilities. . . . . .

"We recognize that the rousing of public sentiment on the question of Ontario's forest service has been due more to the terrible loss of life in the Claybelt fires that to any other consideration. The lack of official data on provincial forest conditions, annual losses from fires, etc., as reflected in the annual reports of the Department of Lands and Forests, has been partly responsible for previous public indifference to the seriousness of the situation. What was not reported upon by the Department was too often accepted as a matter of no public concern.

"The proof of the efficiency of modern protection systems is available on every hand, in the 24,000 square miles of privately-managed limits of Quebec,

in the whole of British Columbia, in the Pacific Northwestern States, and in some of the Ontario Reserves.

"In practically all of these areas, the freedom from forest fire damage to life and property can be ascribed to three main features:

"Power of control by the rangers over settlers' clearing fires through the 'permit law.'

"Centralization of ranger control; skilful management; with frequent inspection.

"The development of mechanical equipment, as trails, telephones and lookout towers.

"It is to these foundations of every successful protective organization now in existence that we direct the attention of Ontario, feeling confident that the Government will not hesitate to place the forest guarding system upon the most modern and efficient basis."

Loan to Settlers.

The first $100,000 set apart by the Ontario Government for loans to northern settlers has been applied for almost entirely, according to a summary issued by Commissioner Dane. Over sixty-two applications were received from Matheson.

Application forms for loans were first sent to the Timiskaming district because of the distress following the recent forest fires there, and resulted in 258 applications for aid, amounting to $92,790, from the district of Timiskaming.

Application forms are now being sent out to the agencies of Port Arthur, Dryden, Rainy River and Kenora. The settlers in the burned districts show by their applications that they intend to use the money loaned to them for developing their farms, relying on the Northern Ontario Aid Committee for their re-establishment.

All the applications recorded above have received the sanction of the Crown Lands Agent for the district, and the loans are either going forward or are only held up for technicalities regarding titles to the lands offered by the settlers as security.

Late John Hendry's Estate.

The gross value of the estate of the late John Hendry, of Vancouver, a former President of the Canadian Forestry Association, was $1,248,829.23, and the net value was $725,783.63. The usual petition for administration of the estate was filed November 1st, on behalf of the executors, Mr. Eric Werge Hamber, son-in-law, and Mrs. Adaline Hendry, the widow. Under the will, dated June 18, 1914, three-quarters of the real and personal estate and effects pass to Mrs. Adaline Hendry and one-quarter to Mrs. Aldyen Irene Hamber. The widow's share is estimated as $544,337.87 and the daughter's as $181,445.98.

The major share of the fortune is made up of shares in the British Columbia Mills Timber and Trading Company, in which the inventory shows the testator owned 6,336 shares of a par value of $100 and a present value of $150, making a total of $905,400. The testator's shares in the British Columbia Sugar Refining Company were valued at $12,000; the Hendry Land Company at $19,875; the Western Canada Power Company, Limited, $48,500, and the Yale Development Company, $45,000. The total value in shares is placed at $1,080,830, and the real estate at $148,955. The shares in the Vancouver, Westminster, and Yukon Railway Company—25,020 in number—were given as of no value.

Penny Wise—Pound Foolish.

(Pulp and Paper Magazine.)

In one part of the country we find progressive paper makers and lumbermen not only carefully guarding against the destruction of their forests by fire but planting trees for future requirements. In another part of the land we find careless settlers setting fires to clear their land, or hunters and campers leaving fires which they carelessly allow to spread at will.

To plant trees for future requirements is a most praiseworthy proceeding, but to allow millions of acres to burn down each year makes our efforts at conservation look sick. It is a Penny Wise—Pound Foolish Policy.

The Heliograph in Forest Fire Detection

Experiments Conducted on Mattagami Pulp and Paper Company's Limits Appear to Demonstrate Its Usefulness

The heliograph as a signalling instrument has been used by military engineers for a great many years, but it remained for the Mattagami Pulp and Paper Company of Smooth Rock Falls, Ont., to adapt it to forest protection purposes.

The success of the heliograph is vouched for by the rangers on the company's limits and by Mr. R. O. Sweezy, a well-known Forest Engineer, who worked out the company's fire protection plans. Mr. Sweezy's experience as professor of engineering at the Royal Military College, Kingston, brought him first into touch with the heliograph which was used in instructional work with the cadets.

In mapping out the patrol routes, locations for lookout towers ,etc., it was found necessary to devise a signal system other than telephones and wireless. The company's limits comprise about 1,300 square miles, mostly devoid of roads. To construct telephone lines, particularly during war time, with materials enormously enhanced in cost, was considered inadvisable. Mr. Sweezy experimented with a few heliographs and succeeded in teaching some of his rangers enough of the Morse code in a week or two to enable them to flash messages to and from the lookout towers. So well did the plan work that more instruments were purchased and placed on other sections of the limits. The heliograph, as is commonly known, operates by the use of two mirrors, one of which is attached to a key. By operating this key on the "dots and dashes" system of the telegraphic code, the flash of reflected sunlight can be controlled at will.

It is a general impression that without brilliant sunlight these instruments would be helpless . This was not found to be the case. Even with a heavy haze, the flashes penetrated to a distance of ten miles and over. In rainy weather of course the fire ranger would have less urgent need to signal. For use at night, electric flash lamps were employed, and for short distances worked very well. The same code of "dots and dashes" was used. To overcome the handicap of night signalling, a new powerful battery lamp has been manufactured in the United States, which is said to give a flash visible at thirty to fifty miles. This lamp will probably be tried out next summer on the Mattagami limits.

While the heliograph has its limitations, those who have witnessed the experiments in forest signalling last summer declare that its usefulness warrants a wider adoption. An instrument with tripod costs about $50 in normal times, but has advanced by about $20 recently. It is not cumbersome or heavy, and can be stowed away in a pack very easily. Learning the code does not prove difficult, and practice for a week or two is said to be sufficient.

The country in which the experiment was tried does not differ materially from the rest of the Claybelt of Northern Ontario and Quebec—relatively flat country with sufficient rising land to provide positions for lookouts giving a clear survey for great distances.

The use of the heliograph will be assisted by telephone lines constructed along the main roads and telephone extension will keep pace with the company's woods operations. Rangers on the canoe routes will likely be provided with heliographs next season.

What Real Fire Protection Does in Quebec

The following tabulation of losses sustained within the area patrolled by the St. Maurice Forest Protective Association of Quebec during 1916 has much interest for readers of the Journal.

On nearly 13,000 square miles of territory, the fire damage to merchantable timber was $700.83; to young growth, $1,185.88; to cut over lands, $3,484.50.

Such a record of comparative immunity is a monument to the efficiency of correct patrol methods. Mr. Ellwood Wilson is President of the Association, and Mr. Henry Sorgius has achieved a reputation as manager.

The experience of the Association in the matter of controlling settlers' fires has been excellent. The present happy relations with the settlers is a matter of tact and education, rather than the rigorous use of legal penalties. The excellent record of the Lower Ottawa Forest Protective Association is not immediately available, but illustrates equally the point that prevention of forest fires is a matter of vigorous co-operation.

Territory Under License.

	Acres.	Valuation.	Value
Merchantable Timber	$ 449.25	$1.56	$700.83
Young Growth	1,091.75	.50	545.88
Cut-over	4,646.00	.75	3,484.50
Old Burn	1,867.50	.10	186.75

Territory Not Under License.

	Acres.	Valuation.	Value
Young Growth	1,280.00	.50	640.00

Settlers' Lots.

	Acres.	Valuation	Value
Young Growth	5.00	.50	2.50
Cut-over	6.00	.75	4.50
Old Burn	195.50	.10	19.55

Town of La Tuque.

	Acres.	Valuation.	Value
Old Burn	1,280.00	.10	128.00

Canadian Pacific's Wood Requirements

The enormous quantity of wood products used by the Canadian Pacific Railway is indicated in the following statement by Mr. George Bury, Vice-President, in reply to a request from the Journal:

Track Ties	5,000,000
Switch Sets	5,000 sets
Fence Posts	200,000
Telegraph Poles	50,000
Piles	20,000
Shims	5,000,000
Tie Plugs	25,000,000
Lumber	60,000,000 feet

Canada's White Pine in Danger of Extermination

Ravages of White Pine Blister Rust Developing serious Conditions in Ontario and Quebec

The spread of the white pine blister rust in Canada has reached such dangerous proportions as to call for prompt measures by our Governments, lumber companies, and individuals. Unless effective means are taken at once, Canada may easily witness a tragic loss of white pine, far more serious than the destruction of tamarack by the larch saw fly.

Canada's white pine possesions have been reduced so seriously by causes other than disease that no effort should be spared to grapple with the new problem of blister rust at the outset. A few months' delay and remedies may be of no avail.

Already the disease has found its way into Simcoe, Durham, Wellington and Victoria counties of Ontario, and most seriously into the Niagara Peninsula. Mr. E. J. Zavitz, Provincial Forester, and Mr. W. A. McCubbin, of the Central Experimental Farm, Ottawa, have been at work for months discovering and defining infected areas and taking measures to isolate and destroy diseased trees and the gooseberry and currant bushes which act as carriers.

Danger to Quebec.

In Quebec, outbreaks have been found near Montreal, at Ste. Anne de Bellevue, and other points. Mr. G. C. Piché, Chief Forester of Quebec, has given prompt attention to the danger, and inspectors have been sent out with instructions to locate diseased sections and apply proper remedies. In the State of Maine, within a short distance of the Quebec border, a serious outbreak has been located, which may easily cause trouble for neighboring Canadian areas of white pine.

Considering the enormous values at stake, and the rapidity of infection, characteristic of the blister rust, it would seem only a matter of wide awake business management that the Dominion Government as well as the provinces of Ontario and Quebec should take this grave matter promptly in hand. To eradicate the present plague of white pine blister rust will require not only a wide investigation of white pine areas, but a very considerable expenditure of money, and the employment of all the skill that Federal and Provincial Government departments have at their command. The aid of the Dominion Government is called for by the peculiar urgency of the situation, and the national consequences that must follow anything but the most comprehensive and thorough treatment.

Quarantine Measures.

Outbreaks in the United States have been located thus far in all the New England States, New York, New Jersey, Pennsylvania, Ohio, Indiana, Wisconsin, and Minnesota. Although it has not yet been found West of the Mississippi, prevention of the shipment of nursery stock from the east and the quarantine of infected areas will be necessary in order to prevent such a development.

Expert opinion holds that the blister rust can be suppressed by the following means:

The destruction of all gooseberry and currant bushes, wild and cultivated, in and near sections where the disease prevails.

The destruction of all five-needled pine trees exhibiting signs of blister rust infection.

Prohibition of the shipment of white pine seedlings from infected sections.

Rust Characteristics.

The blister rust which is parasitic on white pine can be detected on currant and gooseberry bushes as a yellow rust on the under side of the leaves. On these host plants it undergoes a change about the end of June and another form of spore develops. This is carried by the wind to the white pine. As wild gooseberry and currant bushes are to be found all over Eastern Canada, there are plenty of host plants to generate destruction of practically every white pine tree we possess.

This calls for immediate action by lumber companies, by Provincial and Federal Governments, by all who have any interest in or responsibility for the saving of white pine forests. To locate infections, and to destroy the diseased trees and all gooseberry and currant bushes in the vicinity comprises the only effective procedure known. Guarding against infected nursery stock is, of course, an obvious necessity. As for the origin of the white pine blister rust, it is supposed to have been brought to America from Germany on white pine seedlings.

A recent conference of officials interested in suppressing the epidemic was held at Albany, N.Y., and in addition to delegations of experts from most of the states where the rust has developed, the following were present from Canada: Clyde Leavitt, Forester, Commission of Conservation; F. J. Zavitz, Forester of Ontario; B. R. Morton, Dominion Forestry Branch; W. A. McCubbin, Division of Botany, Central Experimental Farm, Ottawa; G. C. Piché, Chief of Forest Service, Quebec.

Blister Rust in B. C.

There is reason to fear the white pine blister rust has secured a lodgment in the interior of this province, in which case infection must have come from one of the border states, says the Western Lumberman."

"Some four or five years ago, if we mistake not, the attention of the Provincial and Dominion authorities was directed to a mysterious blight that seemed to be attacking trees in some parts of Okanagan district. An investigation was conducted by an expert from Ottawa, but unfortunately very little was then known about Pine Blister Rust, and beyond recommending the destruction of the affected trees the expert had no advice to offer.

Logger in Daring Feat.

A few weeks ago the crew of Higgins' logging camp at Cameleon Harbor, Tribune Channel, about 80 miles north of Vancouver, witnessed an act of remarkable daring and agility, performed by one of their number, which will doubtless be talked about for many a day in the Coast lumber camps, where feats of daredevil bravery are as common as "scraps" among school boys.

In the course of a shift to a new logging location it became necessary to attach a cable to a very tall tree at a point 120 feet from the ground. Usually this is done by a workman equipped with pole-climbing spurs and belt, but this time these means were not available. What was to be done? It would take several days to secure the equipment from Vancouver, and a shutdown of the operations for that length of time was not to be thought of owing to the heavy expense involved.

This is where tall Andrew Busby came to the rescue, if reports are true. He was an expert chopper and skilled in using a springboard. With his axe and two springboards he began to climb the tree. Standing on the first board, he chopped a notch five feet above him, slipped the second board into the notch, climbed up, and, drawing the first board after him, repeated the performance a score of times. In an hour, while his companions below watched him breathlessly, he reached the top of the tree and affixed the rope. Standing on a board a few inches wide, he was apparently as cool at 100 feet from the ground as when he was only five feet from terra firma.

Busby is now a private in the 230th Forestry Battalion, having enlisted in Vancouver a few days after performing the act above recorded.

Where a Settlers' Permit Law is Needed

TYPICAL STAND OF SPRUCE AND JACKPINE ON THE EDGE OF AN OLD BURN IN THE RIDING MOUNTAIN FOREST RESERVE, MANITOBA.

YOUNG MIXED FOREST OF PINE AND SPRUCE IN ATHABASCA RIVER VALLEY, ALBERTA.

How Long Will Our Timber Last?

A Frank Discussion of Forest Problems in Quebec Province With An Outline of Needed Reforms

What is the timbered area?
How much of it is accessible?
What is the annual consumption?
How long will the timber last?
To what hazards is the timber exposed?
How is it being exploited?
What are the wastes?
How can the stand be converted and improved?

Mr. Ellwood Wilson, Chief of the Forestry Division of the Laurentide Company, Grand'Mere, Quebec, was asked to appear before the Dominions Royal Commission at Montreal to give information as to the forest conditions in Quebec Province. Mr. Wilson's memorandum is of such interest and value, containing original data and offering candid opinions on many features which are commonly passed over, that the Forestry Journal has condensed portions of the manuscript, omitting the statistical basis.

The statement of Quebec conditions refers to that part of the province lying north of the St. Lawrence River. The total area timbered is about 303,855 square miles. The area accessible at the present time to points of consumption is 147,247 square miles and the inaccessible area 101,722 square miles.

The total amount of available standing timber, states Mr. Wilson, is 363,603,200 solid cords of wood or 483,592,256 stacked cords. The memorandum proceeds:

Growth in Virgin Forests.

"Now timber is like gold, or iron, or coal, or any other natural product, in that there may be immense quantities of it in any given locality, but if it costs more to get it to market than it can be sold for, it is for the time being, or until the price rises sufficiently, inaccessible—and this must be taken into consideration when estimating timber supplies.

The approximate total consumption for spruce and balsam for 1915 was about 3,050,281 cords, which would give us at the present rate of consumption enough available timber for 150 years. Our consumption has increased, however, 290% in the last seven years, and if we allow only 10% per annum, at the end of 55 years all of the timber at present available would be used up. Now here a very important question comes up—and that is the amount of growth in a forest each year. At first thought it seems that a forest of growing trees will increase the amount of timber from year to year, and this is true of forests which are under control, or of an area which is growing trees for the first time, but it is not true for a so-called virgin forest which has been growing for an indefinite number of years, and in which trees of all ages and different species are found. Here nature has reached a state of equilibrium and the amount of growth each year is balanced by the amount of decay. So that if we have areas stocked by nature and there is a certain amount of timber on them, there will be practically no more on them at a given number of years than there is at present. This, however, does not hold good for areas which are lumbered, for here, the cutting out of certain trees gives an opportunity for a new crop, and this crop will continue to grow and produce timber until the land is fully stocked again, provided the conditions are right for the re-seeding of the proper species and their growth into mature trees.

Timber Cut Rises.

"In discussing this whole question I should like to draw my conclusions from a smaller region with which I am more familiar, and leave the question of the whole Province for those who have travelled more widely than I.

"For the last twelve years I have worked in the valley of the St. Maurice River, and have surveyed and mapped an area of about 2,500 square miles, and have travelled over practically the whole valley. I have also made careful studies of the amounts of timber on sample sections over the whole of the area, and studied conditions of growth and reproduction, and am in consequence able to give facts from which anyone can draw his own conclusions.

"The valley of the St. Maurice River contains about 12,329 square miles, and has all the timber types of the province except the Northern Subartic.

"The approximate amount of timber cut in this section for 1915 was 408,516 cords. This is a little under the total quantity, as I was not able to obtain exact figures for timber taken out by rail by one or two of the smaller operators. In 1910 the amount taken out was 282,720 cords, so that in five years there has been an increase of more than 140%, and this is at about the rate of 28% per annum.

Fifty Years' Supplies.

If we take it that the increase will be only 10% per year for the future we find that on the basis of our estimate there is only *standing* timber enough for fifty years. Areas which have been burned over cannot be counted on to produce pulp wood in sufficient quantities to be cut under forty years at the best, and areas which have been lumbered show that there is not sufficient timber left under the diameter limit set by the government to produce within thirty years more than three to five cords to the acre, and the figure is nearer three cords than five. If we say that the total area lumbered up to the present time will produce at the end of fifty years ten cords to the acre there will be at the time the standing timber is cut off just about enough to take care of the consumption at that time for one and a half years. The growth on the areas lumbered each year from now on will not be sufficient to take care of the increased cut.

Growing New Crops.

"The conditions for reproduction are on the whole fairly good. On areas that have been burned over much depends on the area burnt and the prevailing winds and the proximity of forests capable of producing seed. As the coniferous trees do not seed each year, it is sometimes several years before any seed is scattered over burnt areas. Then sometimes a nurse crop of poplar and white birch comes up before the spruce and balsam commence to seed. I have seen several very large areas which were burnt more than fifty years ago on which there is to this day no reproduction of spruce or balsam except a few scattered trees. Then, too, the reproduction as practised by nature is very haphazard, being either too plentiful, as in the case of balsam, which often seeds in such dense stands that it has no room for proper development and the trees push up into thin, spindling poles which die early from disease, or blow down. Generally, however, the reproduction is only a small percentage of what the ground can carry and the trees grow up knotty and bushy or are crowded out by less valuable species.

Choking the Soft Woods.

"In regard to reproduction on cut over areas, cutting, as is done under the present system of arbitrary diameter limit, is practically using a selection system which favors the species which are at present unmerchantable, as the hardwoods. By cutting out the coniferous trees, the hardwoods are given less competition and their growth favored and the opening up of the stand allows them to seed in and their rapid growth seedlings choke out the softwood production.

"Then, too, the forests are subject to many hazards, the chief being fire, the second insects and fungi, and the third wind. Fire has in the past swept over more than a third of the St. Maurice Valley, and a few large fires would very seriously reduce the amount of

TIMBERED ISLAND ON ATHABASCA RIVER AT MOUTH OF PASS CREEK, ALBERTA.

our future supply. On areas which have been lumbered, and the tops and branches are allowed to remain and rot on the ground, the most favorable conditions are presented for the growth of fungi and for the increase of insects which attack the standing timber. Then, too, where the stands, especially of balsam, are too thick, the trees are weakened and easily diseased. There are districts where practically every balsam tree is defective.

Loss in Winter Logging.

"The methods of exploitation are the same as when the country was first lumbered. Up to 1908 no changes were made in methods. Naturally in cutting timber, one takes the most accessible timber and that which can be cut and transported at the least cost, so that the first lumbering was done along the river banks and around the borders of lakes, and only the largest and best trees were taken. Up to 1908, not more than twelve per cent. of balsam was taken by the companies manufacturing pulp, now practically no discrimination is practised between balsam and spruce in cutting. The result of this method of cutting is that areas have had to be logged over many times in order to get all the available timber; sections which were rocky or difficult to approach were not cut and timber distant from the waterways was left. Now the hauls have materially increased, with an increase in logging expenses, and in other places the amount of timber is too scanty to go back for, and sections unlogged are often so difficult of access as to make the getting out of the timber impossible at a profit. Logging is done in the winter, which adds much to its difficulty and expense, and is responsible for many wastes, such as high stumps, logs lost in the snow, and slower work.

"The most obvious wastes under the present system of logging are high stumps, usable wood left in the tops, the use of spruce and balsam in building camps, when white birch and poplar can in most cases be used, the use of merchantable wood for roads. There is a lack of proper inspection of the operations, nearly all the operators letting out contracts for the cutting of their timber, without adequate supervision of the operations. Some of the companies have developed good inspection systems.

Fire Protection First.

"The following improvements are obvious:

"First, a good system of fire protection for the province outside of the St. Maurice and Lower Ottawa valleys. In these two sections co-operative Fire Protective Associations are in existence which practically eliminated the fire hazard, showing what can be done. In other sections the Government should force the limit holders to properly protect their holdings; this can be done at small expense, one-quarter of one per cent. per acre per annum. In order to do this the Government must have properly qualified men to act as inspectors and must have *enough* of them, and it must protect the areas which are not yet under license. Under the Hon. Mr. Jules Allard, Minister of Lands and Forests, great progress has been made, and he has shown the greatest desire to properly protect and administer the great public domain under his charge. His Department has been one of the most important in producing revenue, and sufficient money has not been allowed him to properly take care of his Department. In order to safeguard the future revenue, more money must be spent annually now.

Change Fixed Diameter.

"The present law which compels cutting to a fixed diameter limit should be repealed and the cutting should be done directly under the inspection of properly trained and qualified inspectors who should be competent to designate the trees to be cut. This of course would mean a large increase in current expenses, but as it must come sooner or later it is better to spend the money before the damage is irreparable.

"Logging should be commenced much earlier in the season and should be finished by the time the snow comes permanently. Camps should be built out of birch and poplar.

"Some system of brush disposal should be compulsory, both in the interest of fire protection and the good of the forest.

"Burnt areas which are not restocking fully should be planted up and everything possible should be done to make it possible and advantageous for limit holders to replace the trees cut by planting.

"The Laurentide Company, Ltd., the Pejepscot Paper Co., and the Riordon Paper Co., Ltd., have begun to plant, and have shown that it is feasible.

"The work of logging and other woods operations should be done by men who have been trained properly in these operations. This work is a sort of engineering, demanding technical knowledge and good judgment, and is too often left to men who are totally ignorant and incompetent. Few operators have any idea of what is going on in the woods, and as long as they have cheap logs delivered to them, are satisfied to leave matters as they are. It takes a long while to grow timber or to repair the damage done by careless handling, and we are too prone to leave the problems of supplying raw material for the future to the men of that day, forgetting that it is we who must lay the foundation."

Quebec Forest Revenue.

According to the report of the Quebec Lands and Forests Department just issued, the total revenue for the year was $1,807,259. Receipts from sales and areas amount to the sum of $75,703.59, while the sale of Crown lands, hydraulic powers, etc., produced the sum of $28,353.81, with expenses for the service amounting to $2,219.50. Revenue from woods and forests amounted to $1,683,682.23, as follows: Ground rent, $352,380.26; stumpage dues, $1,221,683.82; penalties and fines, $24,255.17; accrued interest, $33,826.85; transfers, $10,720; premiums, $40,816.13. An area of 339,725 acres was subdivided during the year, and 103,658 acres reverted to the Crown. There is at the disposal of the Government at present 7,465,637 acres.

A Large Enlistment.

Since the outbreak of the war no less than one hundred and eighty men employed in the plants of the Provincial Paper Mills Co. have enlisted for overseas. This number constitutes about thirty per cent. of the working forces of the company, which is a splendid record.

On the Field of Honor.

We regret to report the death at the front of another student of the Forest School of Toronto University—Second Lieut. James Douglas Aiken, attached to the Royal Field Artillery of the British Army. Mr. Aiken's home was in London, Ontario, where he obtained his primary education, going up to Toronto for the teachnical course at the Forest School, which he completed last January. He was a member of the C. O. T. C., and one of the first draft of 41 officers chosen to receive commissions in the British Army. He had been on the Somme front since March, and was personally congratulated by the General of his division on Easter Monday

Mr. Aiken worked for two summers for the Dominion Forestry Branch, during the summer of 1914 being engaged as student assistant on traverse surveys in the Rocky Mountains Forest Reserve, and in the summer of 1915 in charge of a survey in Eastern Manitoba.

Sawdust Cement for Floors.

In answer to a letter written to the Forest Products Laboratory at Madison, Wis., with a view of ascertaining for an Australian correspondent a formula for a sawdust-cement composition for sawmill floors and other purposes, The Timberman, of Portland, Ore., is in receipt of the following reply:

"Madison, Wis., Sept. 26, 1916.

"The Timberman: There are a number of different kinds of sawdust and cement compositions used in the manufacture of flooring for offices, mills, barns, etc. We took this matter up rather recently with one of the other government bureaus which was interested in the subject, and also with the Portland Cement Association. It appears that entirely satisfactory floors composed of cement and sawdust have been laid and are at present in service. On the other hand, the cement association, judging from the tone of the correspondence which we have had with it, does not believe that sawdust and cement mixture are practical materials for floors."

Repulping Paper.

An American inventor has discovered a means of utilizing a waste digester liquor for removing ink and color from waste news and without discoloring the fibre, so that the paper may be repulped. "I have discovered," he says, 'that by subjecting waste print paper, either in a pulped state or in the whole, to the action of spent digester liquors, under any temperature, for the space of one hour or more, then washing the pulp with fresh water, all ink or coloring matter that may be in the paper will be entirely removed, and without discoloring the fibres of the mechanical wood pulp, leaving the same fit to be re-made into white paper. If the waste paper be first pulped, it may be charged into a beater vat filled with either of these spent digester liquors, and by the action of the beating engine all ink or coloring matter will be entirely freed from the pulp. The solvent may then be drained off and the pulp washed in fresh water, leaving the same in a state to be re-made into white paper."

GROWTH OF N. Y. STATE FORESTRY ASSOCIATION.

The Executive Committee of the New York State Forestry Association has announced that Mr. Victor A. Beede, Assistant State Forester of New Hampshire, will be the permanent Executive Secretary with headquarters at the Syracuse Chamber of Commerce, Syracuse, N.Y.

Mr. Beede is a graduate of Yale University, the Yale Forest School, and before entering the U. S. Forest Service studied forest conditions in Germany, France and Switzerland.

With a Secretary to give his entire time to editing the magazine, increasing the membership and the general activities of the Association, a most successful year is anticipated. Mr. Beede possesses qualifications of a high order, and will undoubtedly build up a strong association in New York State.

Paper Prices and Forest Fires

Independent of other causes operating to increase the price of paper to Canadian publishers, the constant destruction of spruce and balsam forests by preventible fires has played a serious rôle. Without question, there is abundance of woods to meet all demands of paper mills, but abundance and accessibility are frequently two very different things. Transportation distance between the woods and the mills is a factor of first importance, as not a few unsuccessful Canadian and American paper mills have been forced to realize. Every additional mile a paper mill is obliged to travel for logs, the costs of the paper product will reflect an advance.

E. H. Backus, President of the Minnesota and Ontario Paper Company, at Fort Frances, Ont., stated recently to Western Canadian publishers that the increasing inaccessibility of pulp limits from the mills is making paper dearer.

Replying to a specific question on this point, Mr. Backus wrote the Canadian Forestry Association as follows: "It is true that I have recently stated that year by year the inaccessibility of the pulpwood supply is increasing. The mills have been cutting their most accessible timber first. Forest fires are continually making large inroads on pulpwood. This situation is a most natural one, and will bring higher pulpwood costs as time goes on."

Unlike small saw mills, the permanently located pulp mill cannot pack up its equipment and follow the retreating forest. Some Canadian corporations have come to see, however, that with care in operating limits, thorough protection against fire, coupled with planting on cut-over lands, pulpwood forests can be perpetuated indefinitely; accessibility of supplies need be lessened but little.

Up to the present stage in Canada the lack of modern fire protection, for which the Governments, as trustees of the timber resources, are chiefly responsible, has reduced the near-at-hand bodies of pulpwood more than the actual cut of logs. The fires of last summer in Ontario and Quebec are an illustration of this fact. The forest fire record in Ontario and Quebec during the past twenty years accounts for vastly more of the accessible forest wealth than has passed into lumber and pulp.

Without question, causes other than unheeded fires are at the root of the paper price advances in war time, but it remains true that since the first paper factory in Canada began to operate, the fire fiend has been laying his tax on the paper consumer.

Who Am I?

I am more powerful than the combined armies of the world.

I have destroyed more men than all the wars of the world.

I am more deadly than bullets, and I have wrecked more homes than the mightiest of siege guns.

I steal in the United States alone, over $300,000,000 each year.

I spare no one, and I find my victims among rich and poor alike; the young and old; the strong and weak; widows and orphans know me.

I loom up to such proportions that I cast my shadow over every field of labor from the turning of the grindstone to the moving of every railway train.

I massacre thousands upon thousands of wage earners in a year.

I lurk in unseen places, and do most of my work silently. You are warned against me, but you heed not.

I am relentless, I am everywhere; in the home, on the streets, in the factory, at railway crossings, and on the sea.

I bring sickness, degradation and death, and yet few seek to avoid me.

I destroy, crush or maim; I give nothing, but take all.

I am your worst enemy.

I AM CARELESSNESS.

The enterprise of the British Columbia Forest Service is seen in this well-equipped exhibition tent placed in a prominent position at the Hazelton Fair.

The town of Hazelton, in northern British Columbia, on the line of the G. T. P., this year held its first agricultural fair, some five or six hundred exhibits being entered. Advantage of this event was taken by the local forest service officers to prepare and display in a separate tent, known as the Forestry Tent, an exhibit consisting on the one hand of many forms of forest protection posters, with photographs ,diagrams and other educative devices, and on the other of a comprehensive selection of forest products, some of which were supplied by the local mills, the whole being embellished with the aid of foliage and bunting.

The exhibit was undertaken to show the relation between conservation and production, and judging by the interest shown, as well as by the variety of questions asked of the officers of the forest service in charge, it went far to achieve its object.

The increasing regard for forest protection is becoming more and more pronounced in British Columbia each year, and the public are realizing to a greater extent than ever their interest in adequate fire protection and the proper management and utilization of the forests.

Circassian After the War.

The European war has not only limited the importation of Circassian walnut but has absolutely kept it out of this market—there is no Circassian walnut.

A great many manufacturers of furniture, and consumers as well, have wondered not a little what will be the ultimate result. Will Circassian walnut regain its popularity? In the minds of many this wood while beautiful in itself is not particularly fitted for furniture but more particularly adapted for the paneling in public buildings where large spaces are to be filled. But few of the manufacturers of the high grades of furniture have used Circassian walnut except to a limited extent, simply because of its unusually large figure, as they do not feel it meets the high tests of good taste.

In discussing the situation with manufacturers of medium priced furniture and the manufacturers of veneers it is apparent that after peace has been declared and there is again Circassian walnut it will not only occupy the position it did before the war, but will be more popular than ever, that is in the medium priced grades of furniture.

Indian Department Requires Lumbermen to Clear Up Debris

New Order Will Have Wide Application—Operators Allowed Compensation of Forty Cents per Thousand Feet.

A move of far-reaching importance has been made by the Department of Indian Affairs, acting on the recommendation of Mr. H. J. Bury, Chief Timber Inspector.

Hereafter, all timber sales on Indian Lands throughout the Dominion will be subject to a clause requiring thorough brush disposal. This introduces the brush disposal principle into lumbering operations on a very large area of Canadian forest lands, over one million acres in the Province of Ontario alone.

The new regulation comes into immediate operation, and applies to old licenses as well as to any that may be issued in the future. It is presumed that lumbermen when tendering for timber to be taken out under this new regulation will doubtless add the cost of this work of brush disposal to the estimated cost of their logging operation and will tender accordingly. In these circumstances the bonus offered will be slightly lower than formerly, but the added advantage of lessening the fire risk will more than offset this slight reduction.

No hard and fast rule as to the method of brush disposal to be followed will be adopted, as it is obviously impossible to have a uniform regulation which shall be applicable to all classes of timber. In a general manner, piling and burning will be followed in coniferous stands, whilst lopping and scattering will be the rule in hardwood timber. These two chief methods will again be subject to variation according to the local conditions.

The Indians take out large quantities of timber annually under permit, and every encouragement is being given to them to conform to the new regulation, both by personal advice and by the offer of a refund of a portion of the dues collected to offset the cost of effective disposal.

As trustees of the Indian population of Canada, the Department took action in the matter so as to reduce the extravagant and unnecessary devastation by fire which inevitably followed woods operations on Indian lands. The revenues from timber sales are turned into a common fund for the benefit of the Indians of the reservation, no part of the expenses of the administration being deducted therefrom. Preservation of the Indian timber will doubtless be assisted greatly by the action of the Department, and what is equally important, the experience after a year or two will afford valuable data on which an extension of the brush disposal system to all Crown Lands might be determined. At present, with a few exceptions, the most that is accomplished by licensees in this regard is the clearing of debris about camps and buildings, and, in a few instances, the removal of inflammable material from the neighborhood of trails along driving streams.

Too often the mention of brush disposal conveys to the imagination of lumber companies a sweeping order to clear away all logging debris over many square miles. This is not the way in which the practice of brush disposal will get its start in Eastern Canada. If a few companies could be persuaded to burn the slash along their

roadways, around their camps, and along some of the most used trails, it would go a long way toward bringing down the fire hazard. Experience indicates that this can be done at a cost which is very small when compared with the probable reduction in timber losses. A Minnesota lumberman, one of the biggest operators in the Middle States, objected very strongly to the imposition of a state requirement of brush disposal, but after one or two years' trial he so endorsed the idea that he voluntarily applied it to all his privately-owned limits.

The Editor of the Journal discussed with the heads of several lumber and pulp companies the question of making a beginning in clearing up dangerous debris. In all cases the companies had had orders in effect for some years requiring a Spring clearance about camps, and in one case a good deal had been done to remove inflammable material from along the edges of driving streams. As in the question of fire protection, however, the companies hesitate to inaugurate at their own expense improvements such as partial brush disposal when neighboring licensees follow no such programme. Were the provinces to insist upon brush disposal along roadways, etc., in a limited and reasonable degree, there does not seem much likelihood that the willing co-operation of lumber companies would be long delayed.

The Dominion Forestry Branch applies a brush disposal clause in all operations on the Reserves, and the Canadian Pacific Railway in its private timber lands of the West has done a good deal in the same direction. The C. P. R. Forestry Department does not dispose of all the slash, but the worst hazards are burned. Thus, in heavy growths of spruce along the streams, where the roads necessarily run, the completion of logging witnesses the burning of all the debris left lying along the river and the roadside. The river and road act as good fire guards during the burning operations.

Slash Law in Massachusetts.

The Slash Law in Massachusetts requires that all brush cut within the limits of public highways must be disposed of, and anyone cutting timber adjoining the public road, railroads or other woodland property, must clear free from slash a strip forty feet wide along such highways, railroads and other woodland property. This law has met with public approval from the start. The State Forest Act created a State Forest Commission. This Commission has already purchased 8,000 acres for State Forests and 4,000 acres more are soon to be taken over. Vermont, New Hampshire and Connecticut also have State Forests, but all of the State Forests of New England combined would be lost in one of the big State Forests in Pennsylvania.

While it is admittedly better for a State itself to own its large woodland areas, there are cases where it is advisable for the Federal Government to take them in charge. Such was the situation in New Hampshire, where a comparatively poor State contained such an extensive area as the White Mountain region, the protection of which meant so much to the adjoining States. The whole of New England has felt the wisdom of the policy which the Weeks law has put into effect. To-day the Government owns in New Hampshire over 300,000 acres which will always be managed as National Forests. By the time the Government completes its purchases, we shall have probably twice that area, which will always be held open to the public and in trust for future generations.—"Forest Leaves."

The farm woodlots of the United States contain about 10 per cent. of the total standing timber in the country, and the annual product from them is about $195,000,000.

One million three hundred ninety-six thousand acres have now been purchased for national forest purposes under the "Weeks Law" in the White Mountain and Appalachian regions.

A portion of the half million dollars' worth of French briar imported annually by the United States for the manufacture of pipes will now be replaced by the use of mountain laurel roots from the Southern Appalachians.

Finding Fires With Aeroplanes

Practical Information by an Aviator, Who Describes Advantages and Costs of an Air Patrol

By

W. E. Boeing,

President, North-west Aero Club.

[In view of the great interest taken throughout Canada in the possible employment of the aeroplane in forest fire detection, the Journal reproduces a most interesting paper read by W. E. Boeing, President of the Northwest Aero Club, before the Logging Congress of the Western Forestry and Conservation Association at Portland, Oregon, a few weeks ago. There are included, also, the questions which were put to Mr. Boeing and the answers he gave.—Editor.]

"We will now take up the question of the feasibility of the aeroplane in connection with forest fire patrol. Under clear weather conditions the origin of smoke is very easily detected, in fact smoke emanating from a chimney or bonfire often serves the pilot in determining the direction of the wind near the surface on which he is going to land, as it is good practice only to land coming into the wind. The presence of a minute amount of smoke is readily discernible from the higher altitudes, as it is one of the most conspicuous objects against the land which presents itself to the aviator when at a considerable altitude.

"In corresponding with the State Conservation Commission of Wisconsin, to ascertain the results obtained by L. A. Vilas, who volunteered his services and his machine for aeroplane patrol purposes in 1915, Mr. Moody, a member of the commission, in reply enclosed copy of some notes which he read before the Forest Fire Conference at Boston last winter, which are of considerable interest. They are in part as follows:

Can See Sixty Miles.

"'At an elevation of 1500 feet on a clear day, a fire 60 miles away in any direction is visible to the naked eye. It is not a case of finding the fire, but to locate it correctly is the job. Smoke will show up very plainly from the air. Mr. Vilas reports that during a flight across Lake Michigan from St. Joseph to Chicago, he was completely out of sight of land or anything for that matter for over three-quarters of an hour at an altitude of 4,600 feet. The first thing that he saw was the smoke from the Chicago rolling mills. This was in sight over ten minutes before any shore line was visible at all. People often ask what a country looks like from the air. It is difficult to describe it except that it looks like a large painted map on a small scale without section lines. The efficiency of an aeroplane in spotting a forest fire is without doubt as practicable as any use to which it could be put. I was very much surprised with what ease a fire could be spotted and located, and there is no question in my mind but what the aeroplane will practically do away with some of the observation towers.

"'The use of the aeroplane in the European war in the way of spotting and locating gun fire, armies of men, supply trains, etc., is well known; all of which objects show up comparatively small in comparison with forest fires.'

"The observations of Mr. Vilas are most interesting coming from the only one who has actually undertaken work of this character.

Study Maps First.

"A pilot can familiarize himself very readily with the country which he has to patrol. A careful study of maps before making his first flight will give him a very good working idea of the country which he is to cover. After seeing the land from the air he should be thoroughly familiar with it, provided he has sufficiently studied his maps.

"The more conspicuous objects which are used from on high to determine location, are railroad lines, highways, streams and lakes. These are all shown on the maps and are very conspicuous from the air. As he becomes more familiar with his surroundings, building or groups of buildings and clearings, after they have turned brown during the late summer and early fall months, will also serve in determining location. It may be interesting to add that hills and mountains from the greater altitudes flatten out and look like level country, likewise it is sometimes impossible to distinguish between forests and pastures. The aeroplane used for fire detection or fire spotting would be of considerable value in being able to penetrate by observation distant sections of the country which are sparsely inhabited and difficult of access, and where the chief menace probably comes from campers.

Wireless of Small Value.

"The use of the wireless has been suggested, but is not to be advised; it would only tend to add weight, complicate paraphernalia and require someone skilled in its operation. Owing to the speed at which an aeroplane travels and the resulting small amount of time required to return to a base to report, nothing would be gained by such an installation and would have no value in this particular connection.

"It is somewhat difficult to estimate the cost of an aeroplane patrol service, however the following figures will throw some light on the subject: The initial outlay for each machine required in this service would be in the neighborhood of $8,000 to $10,000. In addition it would be necessary to provide housing and appliances for the maintenance at the station from which the machines would be operated. The building and appliances could probably be installed at from $500 to $1,500. Depending upon their character and permanence. As the work done in this connection would be during the summer months, temporary housing of canvas might be sufficient, which would very materially reduce the expense. It would be advisable to maintain two machines from each base in order that there would be no interruption of the service. The approximate monthly expense of maintaining a station would be as follows:

Salary of aviator	$200
Wages two mechanics $100 each	200
Gasoline, 15 gals. per day, 30 days,	90
Oil approximately 1 gal. per day	15
Miscellaneous supplies $20 and upwards	20
Total	$525

"The above fuel and oil cost is based on two hours flight per day, or an average distance of 140 miles. Possible breakage to the equipment would also have to be considered."

Discussion.

Q. How would the roughness of our territory affect the proposition? As I understand it, one would not circulate aimlessly looking for fire, but make a fairly straight course high enough to see in all directions.

A. At a mile high a man could glide five or six miles, thus could reach one of two landings 12 miles apart.

Q. Would that be too high for locating fires?

A. No, about right. And he would want to be at least 3,000 feet on account of topography.

Q. How about mountain air currents?

A. We generally figure the air affected by obstacles on a plant surface to a height 2½ times the obstruction, but it would be nothing like that with mountains. I think by keeping abreast of the higher peaks there would be no trouble.

Q. A mountain lookout sees through a smoke blanket obliquely. Could an aviator, by looking straight down, penetrate smoke that would trouble our lookouts? If so, perhaps we could

solve the weakness of the lookout system of detecting fires?

A. I have not had experience in smoke, but this is true of fog. Often when it seems very dense on the ground we can see through it from above.

Q. How fast must a machine travel to keep up.

A. It depends on the type; probably fifty miles an hour.

Q. What is the rate of depreciation on machines?

A. Possibly more than on Fords.

Q. Could a man go up every day for two months with reasonable assurance against breakdown or accident?

A. Oh, yes. The modern machine is about as safe as an automobile or boat unless you try to do something spectacular.

Q. How large an opening in the woods is required for landing?

A. Very few acres would do to land in, for you can spiral in coming down. It takes more room to get up again.

Q. How long would it take to get down and report after finding a fire?

A. Figure it 75 miles an hour to the reporting place.

Q. How closely could you identify the location of a fire?

A. I think the aviator would soon learn his country well enough to locate closely by reference to known landmarks. Topography appears flattened out to an aviator. He does not work by reference to hills and valleys like a man on the ground, but by having every other feature but these very much more evident than to the man on the ground. It is more like looking at a map. Buildings, roads, streams and openings are conspicuous, and their position with relation to each other is clear.

Q. How would you communicate when you found a fire; drop a message at a telephone point, or stop?

A. Both are practicable, but I should say best stop. Remember you wouldn't need a telephone at all landing places because it don't take long to fly 30 or 40 miles.

Q. Are electrical storms, such as cause many fires, dangerous to flyers?

A. They would not interfere at all.

Q. It still strikes me that this would be only an intermittent service. With the fixed lookout you can report immediately by telephone; you can probably get two bearings on the same fire and locate it accurately; you are there to get new fires as in the case of an electrical storm when I have known 19 to start one after another; and you are there all the time. The aeroplane begins to lose valuable time as soon as it finds the first fire. And as to the smoke obstacle, I think it has been exaggerated.

A. The point is that none proposes to replace the lookout system. The thought is that every protective unit may have an aeroplane as an auxiliary; not used at high expense when lookouts are adequate, but to help keep in touch with the situation in bad times when the whole system is overtaxed—when men on the ground are overworked, when lookouts cannot see, when the whole system is breaking down and we feel helpless. That is when fires cost money and when any help pays, even at high expense.

Fireproof Paper.

An English patent has been taken out by T. J. I. Craig and others, of Manchester, on a method of fireproofing paper. According to an abstract in Journal of the Society of Chemical Industry, in the process of rendering materials non-inflammable by means of sodium aluminum carbonate, these materials in which the proofing agent cannot conveniently be precipitated in situ, may be treated by mixing or coating with a preparation of the double carbonate.

What Is Sulphite?

Almost everybody in the printing and allied trades can answer this question, but for the benefit of readers who are not quite certain over the matter it may be explained that sulphite pulp is obtained by a chemical process in which acid is used. The wood cells are separated from the other constituents and formed into cellulose, as it is known in trade, sulphite, pulp. When the same process is conducted with an alkali the product is known as soda pulp.—Printer and Publisher.

A Forest Service That Booms Business

How British Columbia's Organization Seeks New Markets as Shortest Road to Successful Conservation

By M. A. Grainger,

Acting Chief Forester of British Columbia.

(From an Address Delivered Before the Rotary Club, Victoria, Nov. 16, 1916.)

When we started the Forest Service in British Columbia many good people, and especially lumbermen and business men connected with the industry, shook their heads very doubtfully. "The logging and sawmill industries of the Province are business propositions," they said, "commercial propositions, which can only be carried on by business men in a practical business way." That was five years ago, and since then we have carried on some forestry in British Columbia, and I think people generally have a better notion of what forestry. I'll tell you some of the forms forestry has taken here.

Take selling lumber; that is forestry. Go through these enormous timberlands of ours and size up the situation. What do you find? You find this: four-fifths of the annual growth, four-fifths of the annual forest income, that Nature asks us every year to turn into dollars, is wasted. We don't use it; we take our mere 30 million dollars from the woods and leave the other four-fifths of one's lumbering prosperity behind. Why? Just because the markets for British Columbia lumber are insufficient. What is the remedy? Obviously, bigger markets and more of them. Get these markets and this appalling waste of raw material will be stopped. Market extension means true forest conservation; and that is one reason why increasing the markets for British Columbia lumber is true forestry and why the forest servoce carries on its market work, co-operating with our lumbermen in every way it can. You are familiar enough with the methods we employ. They are the usual publicity methods, advertisements in papers and periodicals, exhibits, and all that sort of thing. But the essential part of the work is the punch it possesses, and the punch is delivered by active, persistent, skilful, personal work by the man on the job.

Substitutes and Advertising.

You must know it is not merely a question of finding new markets for British Columbia lumber to be sold in; it is a question of protecting the markets we already have. Where would the province be if any serious proportion of its existing lumber business were wiped out? It could not happen, you will say; people have got to buy lumber; it is a staple article like wheat. Well, they have been carrying on a searching investigation into the lumber trade of the United States, and this is what they have found as a result—just one-fifth of the entire lumber market that existed eight years ago has been wiped out. Wiped out by substitutes; steel, concrete, bricks, patent roofing, asphalt paving; wiped out in some cases because the substitute was the better article, but in far too many cases simply because the makers of substitutes used modern selling methods and the lumbering industry did not. There is no better selling method than giving good service to the consumer; helping him to use your material and to get the best value out of it. That is the method we have adopted in this business forestry, or forestry business, of ours. Many a sale of British Col-

umbia lumber has been made this year to prairie farmers who have been supplied by us with building plans, and bills of material showing them how easily and well they can build barns or sheds or chicken houses with British Columbia lumber. And, just as we have done in this case, we hope to cooperate with our lumbermen and get all the best selling methods carried out in this community effort to increase the sale of British Columbia lumber.

Profits of Advertising.

Now take another side of forestry—the protection of standing timber. Lots of people think this just means fighting forest fires, but that is not the point at all. Forest protection means two distinct things. Firstly, it means educating public opinion. Just as a breakfast food company keeps banging away with advertisements, so it is the business of the forester to educate public opinion to be careful with fire in the woods. People used to think it was a "josh"; these scare-head posters on country roads, these articles in newspapers, these paper cups for campers with "be careful with fire" stamped on them; these pocket whetstones we have given away to lumberjacks and preemptors and all sorts of men who work or camp in the woods. But this publicity campaign has proved itself; people are becoming more careful every year, we notice our fires are caught sooner and cost us less money on an average; the whole cost of all the publicity work responsible for this change has not amounted to the expenditure you may have to make in fighting a single serious fire.

Brains in the Forest Service.

Now this work of education is carried on to prevent fires from ever starting, as far as possible. The second part of forest protection is simply this: good organization, supervision; the training of the man on the job to use good judgment in handling fires when they start. Good judgment is the one thing needed. There is no line of work in which it is so fatally easy to waste large sums of money as in fighting forest fires. It is emergency work, it needs cool judgment and experience. You can easily waste more money on some fire fighting effort than what you save is worth. But mark one thing: you have to realize what is worth saving. I remember an official report of an Eastern Canadian Government once congratulated the country because the bad fires of the year had done no damage, "only young growth being destroyed," as the report said. Now that is absurd; if you are going to adopt a general principle of letting the young growth burn, good night to the lumbering industry of British Columbia before this century is over! But let me repeat again, forestry means the putting of such matters as the fighting of forest fires on a business basis.

Take another line—the stock taking of forest resources. A fancy line you will say; sort of collecting data and masses of useless information and writing volumes of reports that no one reads. Now we have done a little stock taking in the last five years, but it is not of that description. It has been done mostly for the simplest, immediate business reasons. Our men have gone into various forest districts and roughly mapped the places where the good timber is. We have not done it all over the province, for lack of men, an dtime and money. But this rough mapping of valuable timberlands protects them from alienation, shows where timber sales can be made, and helps in the arranging of fire prevention work. It is a side of business forestry.

Bracing Up the Treasury.

Now come to forestry as a money maker for the public treasury, something that makes your taxes far lighter than they would be otherwise; one-third of every public dollar, two to two-and-a-half million dollars of yearly revenue already, and going to be a good deal more than that. That revenue has to be worked for, it will not keep coming of itself; and so forestry here in British Columbia means an organized forest service with an annual turnover about equal to the three largest of our lumber manufacturing concerns combined. It means a considerable business in valuing and selling timber; it means inspecting logging operations to prevent trespass; it

means making sure that cut timber pays the proper dues.

The tourist at a logging camp just sees a boom of logs. Our rangers see material that the Crown is selling, something on which any one of twenty different sums of money should be collected. He has to see that these logs are clearly marked so as to show which of these twenty different amounts—ranging from one cent to two or three dollars a thousand feet—must be paid on these logs.

I have touched on four aspects of forestry in British Columbia:

Forestry as selling British Columbia lumber.

Forestry as forest protection.

Forestry as stock taking of timber resources.

And Forestry as collecting money.

Too utilitarian, you may say. How about posterity; how about taking long views to safeguard the future; how about the development of a permanent forest policy? Do not mistake my meaning—these things must never be forgotten by any public service engaged in forest management. Forestry, in the broad conception, is merely a great form of agriculture; the harvesting of Nature's successive timber crops; and we in the West, in our business of harvesting the present enormous crop, must not neglect to safeguard, in every practicable way we can, the next crop that is now growing.

Forest School Needed.

Trained men are needed in the work of forestry. What means of training does British Columbia provide? Do you know that almost every Western State deals with this question. Oregon has a forest school, California has a forest school; so has Washington, Idaho, Montana and Colerado. Logging engineering is being taught as a profession, just like civil engineering. Do you know that British Columbia provides no training whatever, though forest industries are our most important ones? Our young men must go and study at Seattle or (if they have the money) they must go back East. With all its various professional equipment the University of British Columbia has no forest school.

And again, the foreign buyer of British Columbia lumber, the city engineer back east; architects the world over ask us, when we try to push the sale of British Columbia lumber—how strong is it, what are its qualities; what engineering tests have been made of it? And we must answer: None! and lose the business. All we can do is to distribute hand books for engineers published by our go-ahead American competitors—like the West Coast Lumbermen's Association at Seattle. It is not good business when a firm has to send its competitors' price lists to its customers because it hasn't any of its own in print. But that is the fix we are in in selling British Columbia lumber. I think you will agree that we need a timber testing laboratory at the Provincial University.

China's Possibilities.

Capt. Robert Dollar, of San Francisco, in a recent address before the Vancouver, B.C., Rotary Club, stated:

"The Russian trade is an unknown quantity just at the present time. The Russians will likely have but the one port of Vladivostok to offer as the only certain port, and that might be shut at any time the Russians so wished. It is to China that you must look for your future trade, and I desire to emphasize this fact right now that China will be your mainstay in the future in foreign trade relations just as soon as the Chinaman learns his own purchasing power. "China has only been scratched for trade," he said, "and when you stop to consider that one-fourth of the population of the world is living there, an immense population which is awakening to civilization as we see it, then you may be able to grasp the immensity of the situation. The day is coming when the Yang Tse Kiang valley will be the greatest steel-producing section of the entire world."

(Courtesy Grand Trunk Railway.)
LADY EVELYN FALLS, TEMAGAMI, ONT.

The Partnership of Farm and Forest

The Old and the New View Points of the Relationship of Timber Crops to Agriculture

By Robson Black.
(Article runs concurrently in "The Farmer's Advocate.")

The Farm and the Forest were born twins, with equal rights in the great Canadian Estate, and not the slightest reason or desire to live in disagreement. What farmer begrudges the service rendered by the silver and coal and nickel mines, or the fisheries on either seaboard? This is indeed a land of many businesses, in which any developer of a natural source of wealth, be it the land, the mines, the fisheries, the forests, is playing benefactor to his generation. We are poor stewards, indeed, if we cannot extract from each of the natural gifts of Providence the maximum wealth and service, without trying to change agreeable servants into quarrelsome rivals.

I have emphasized the identity of interest as between farm and forest for a good reason. The older days of Canada bred a notion in the minds of men and women that tree life was a cumberer of the ground, that forest fires were a blessing in clearing lands, that the lumberman was a "predatory" creature, appropriating some easy money without much effort, and that Canada owned so much timber that nothing could reduce our super-plenty. The Forest, of course, had no spokesman. Where agricultural experts by

the hundred flourished and preached the common sense claims of Agriculture, not a single forestry expert put in an appearance in Canada until a comparatively few years ago. Any public representation of the quantity of our remaining forests, the innocence of forest fires, and careless lumbering was accepted at face value, for there was none to argue against it. The Forest has been our most shabbily-treated national resource. Demanding quite as much scientific management as Husbandry in order to produce highest dividends it has been treated in the past like a crop of front-lawn dandelions that deserve extermination. Had the growing of forests been looked upon as an ally of agriculture, which it most truly is, we would have applied our brains to it twenty years ago as to crop rotation and pure bred stock.

Putting All Lands to Work.

Crops are crops, whether trees or wheat. There may be a conflict of opinion as to placing oats or wheat on a certain acre in a certain latitude. But there never can be much conflict about the tree crop. It grows on all soils, but is content to grow where cereals would wither. The true conservator, therefore, regards forest crops in this manner: give to the farmer for field crops every acre in the Dominion on which such things will flourish. But about fifty to sixty per cent. of the whole area of Canada is not fit for field crops and will not pay the plowman his salt. Shall we leave that sixty per cent. as desert or put it to work? By all means put it to work—the only work it will do—growing timber.

A good illustration comes to hand from New Brunswick. The Government of that province is carrying out what amounts to a double survey of the whole provincial area now under forest growth. Rather than locate new settlers ignorantly, the authorities will be able to put their hand on nearly every square mile of agricultural soil and know positively that it will bear crops and is worth opening up. They will also possess detailed information as to every acre that will grow nothing but timber and can intelligently mark off such lands from any chance of settlement. Thus, at a stroke, the future agricultural development of New Brunswick is given an important safeguard, the revenues from timber lands are assured, and there need never be enacted the tragedies of misplaced settlement and abandoned farms. Every province of Canada should have a careful soil survey preceding settlement. Until that is done and until entire communities are transported from their present hang-dog surroundings to lands that will give them crops we cannot expect to take medals as agricultural managers.

Our Future Immigrants.

We perceive in these stirrings of Governments some recognition of the Forest's claim for scientific study and a clear-headed plan of business management and development. No farmer wants to think of a timber famine and soaring lumber bills. Neither does he invite the ruin of the great wood-using industries for lack of supplies. In both cases he will be a grievous loser. Yet our total of accessible timber is not large. We have only about one quarter what is possessed by the United States. We have burned about five times as much as we have cut. With a population of a few millions we have allowed our once splendid areas of white pine to be scourged into a remnant of timber berths. Yet, knowing these things, we beckon to Europe for ten or twenty millions of lumber-using immigrants. How shall we supply them, if we are heading for exhaustion on our present basis of population? These are questions none of us can ignore.

The farmers of North-western China took no heed of conservation necessities and to-day one may see stretches of hundreds of miles, denuded of forests and stripped of farms. The farmers of Palestine and Syria, Greece, Central Spain and parts of Italy likewise gave them no heed and were driven out by flood and drought, wind storms, plagues of insects and the scarcity of fuel and the commonest wood supplies for farm and home. In the Empire of India, the mass of people are agriculturists, but wood is so scarce that prices run to $100 a thousand feet, and the

families content themselves with mud shelters, primitive working methods and wages of a few cents a day. Wherever we go over the earth we learn that the balance of Nature cannot be disturbed without disastrous consequences. Where the forest is swept away, the farm follows.

Our Governments as Stewards.

What is the duty of the Canadian public toward their forest possessions? First, to guard them against fire. One would think that Governments, as public trustees, would have thrown an insurance policy about such indispensable possesions, but the truth is that we are only in the primer class in fire guarding. We have enough good examples, as in parts of Quebec and all of British Columbia and Nova Scotia, to show that bush fires can be put out of business and forested country rendered safe for human life and property. There is very little reliable information on forest fires of past or present, and this had hidden from the public the incredible losses they have sustained. We have shielded ourselves with the notions that forest fires were visitations of Providence and that plenty of timber remained. If any reader of this article takes comfort in the possibilities of re-planting the forests in the wake of irretrievable fire damage, it is well for him to remember that *planting forests with tiny seedlings* costs at least $12 an acre, while protecting the full grown forests of giant pine or Douglas fir against burning, costs only half a cent an acre. The forest fire is the biggest thief in Canada to-day. It seeds upon the indecision of Governments just as Governments avoid preventive action by the indecision of the easy-going voter. Any Government that wills it so can put a stop to forest fires, for we are lagging behind every decently governed country in the world in the sane employment of our forest resources.

Forest Influence on Stream Pollution

By N. R. Buller, of Pennsylvania Department of Fisheries.

The relation of the forests to the streams and stream pollution is naturally very close. Without forests we could not have beautiful streams and without beautiful streams the forests would be lacking.

Before the white man took up his residence, all th ewater in the lakes and streams was pure and undefiled, fitted for man to drink, for the cattle to quench their thirst, and for the fish to live and prosper. There is no greater chemist than Dame Nature herself, and she works with a will and earnestness that should excite the emulation of man.

When a tree fell in the forests the oxygen in the air produced to make it useful, and the carbonic acid resulting from the work of the oxygen was taken up by the growing tree alongside of the fallen one, and the carbon converted into plant life, while the oxygen was once more given off free to the air to again resume its chemical work. Similar processes were transformed so that from day to day there was an everlasting work of the chemical forces to destroy those things which have lived their lives and to build up those which were beginning their lives.

Nothing in nature is without its use. If the trees and brush along the streams and lakes, in course of time, fall into the waters they become shelters in which the small fish could hide, the microscopic animalculæ on which the little fish lived could propagate and thus subserve a useful end. There was no trash in those days when nature ruled supreme and man did not intervene his wasteful hand.

With the coming of man all these things changed. He saw only those things which he could convert instantly into value and carelessly allowed to run away everything that could not be turned into instant use without some extra course of treatment. In the mountain-side a spring of pure water gushed forth and started for its trip to the ocean with as unerring an instinct as that which inspires the tendrill of the pea vine to reach out for a support that it may climb heavenward.

The rill of water increases and grows as it pursues its way, joined by other little rills until it becomes a creek, and then winds out to the river. In the clear, cold spring water nature planted our brook trout, which you are all familiar with, if you have ever tried your hand at trying to land him. As the stream grew wider, the water warmed under the sun's rays and the trout refused longer to dwell in the waters which enervated him as the Turkish bath enervates its devotees. In these warmer waters nature placed the bass and salmon and the other fish which we class as food fish. You will see here the relation of the forests to the streams. The warming up of the water in most of our trout streams is due to the deforestation. When the forests are cut away the sun's rays have a grand opportunity to make the waters warm. If the banks of the streams were lined with trees, as they should be, this would not be the case.

On account of the deforestation of our mountains and hillsides, the Department of Fisheries has inaugurated the distribution of fish in the yearling stage. The fish in this stage are able to meet the conditions and take care of themselves much better than the small fry which was formerly placed in our streams. When the streams were lined and practically covered with forests there was plenty of food for the young fish, but since these have been cut away the conditions have to be met by planting larger and stronger fish.

There are, according to statistics, over forty-eight thousand industrial plants located along the streams of Pennsylvania which are running their refuse into the streams. If you stop to think of this for a minute you will realize what it means to the streams and forests. If the stream is polluted by industrial waste, it is, naturally, depleted of fish and the shrubbery is killed all along the stream, which detracts from the attractiveness of the stream as well as the forest through which it runs. The streams could be cleaned up if the Department wanted to go ahead and stop the wheels of industry, but it is not the desire to do this. It is the desire of the Department to assist the manufacturers rather than to harass them, and for this purpose a filtering apparatus is being recommended which will stop the polluting of our streams. Much good is being accomplished along this line.

Annual Meeting To Be Held January 15th

The eighteenth annual meeting of the Canadian Forestry Association will be held on Monday, January 15th, 1917, commencing at 10 a.m. Lieut.-Col. J. B. Miller, President, will occupy the chair.

While the programme has not been definitely fixed at the time this issue of the Journal goes to press, it is certain that the problem of White Pine Blister Rust now threatening the ruin of Canada's white pine possessions will occupy a leading part. The meeting will for a time resolve itself into a conference of provincial and federal authorities, the object being to determine a course of action by which speedy and thorough suppression of the disease may be attained. No subject has more importance or interest, and while the Forestry Association has been advertising the Blister Rust danger for some time past throughout Eastern Canada, in an effort to stir up public opinion as

to its dire consequences, a plan of co-operative action is immediately necessary. What part the Provincial and Federal Governments shall play in the matter should be clearly ascertained and appropriate action taken by the Association.

Another subject which, it is hoped, will have a prominent place on the programme is brush disposal. The subject is an integral of fire protection. Eastern Canada has been by no means a crusader in experimenting with the removal of logging slash, and some live testimony from practical lumbermen in Minnesota and elsewhere who have applied the brush disposal principle to commercial lumbering operations would be interesting and stimulating. Contributions to the subject from Canadian sources should prove of equal value.

Other subjects will be on the programme, a detailed announcement of which will be sent out in ample time to all members.

Grazing in the Woodlot.

The most important step to take in the care of the woodlot is to protect the trees of the future. Unless the young trees, which go to make up the undergrowth of the woodlot are protected there can be no trees to replace the mature ones as they are removed. Without trees there can of course be no woodlot.

Grazing animals are one of the greatest hindrances to the proper development of the small trees. It is almost as impractical to pasture cattle on the same piece of ground as one is attempting to grow trees as to pasture them on a piece of ground on which one was attempting to grow oats. Not only do the cattle destroy a large number of the small trees by eating the top off, but they trample them down and the sun and wind have an opportunity to act on the soil and dry it out or bake it, thereby causing the tops of the larger trees to die back. On open patches within the woodlot or where the borders are thin, young growth should be encouraged as much as possible.—B. R. Morton, Dominion Forestry Branch.

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The Farm Woodlot.

(By B. P. Kirkland, University of Washington.)

The farm woodlot product of the United States as a farm crop, according to the 1909 census, was worth very nearly 200 million dollars. The real significance of this becomes clearer when compared with the value of our grain crops, only three of which reached this figure, wheat, corn, and oats.

The forest can be grown on hill sides, in gullies and on other poor land which will never be worth clearing. A profit may be made from the sale of fuel, posts, railroad ties, pulp wood, mine timber, lumber, etc., depending upon the location of the tract and size of the timber and the market demands. If both thinnings and the final crop are utilized 2½ cords or 1,000 feet B.M. per acre per annum or more may be secured. The main aim should be to produce small saw timber such as can be sawn by inexpensive portable mills right on the ground so as to furnish rough lumber for farm building.

The question now to be answered is how much area of farm forest the average farm should have. I base this quite largely on annual fuel consumption. I believe if a farm home is heated as well as good city houses, as they will be in time, it will take from 10 to 15 cords of fuel wood per annum. Since this fuel wood should be a by-product from the saw-timber forest I should say the average farm should have reserved not less than seven to ten acres of young timber for this purpose. Ten acres ought to supply all fuel, posts, poles and in the long run all saw timber needed on the average farm.'

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FOREST VALUATION

By Professor H. H. Chapman, Yale University.

A valuable book for those not already familiar with the economic and mathematical principles on which the theory of forest finance is based.

283 pages, 6x9. **Cloth, $2.00 net.**

ELEMENTS OF FORESTRY

By Professors F. F. Moon and Nelson C. Brown, N. Y. State College of Forestry at Syracuse.

Covers, in an elementary manner, the general subject of forestry.

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LOGGING

By Professor Ralph C. Bryant, Yale University.

Covers the more important features of operation. Discusses at length the chief facilities and methods for the movement of timber from the stump to the manufacturing plant, especially logging railroads.

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MECHANICAL PROPERTIES OF WOOD

By Professor Samuel Record, Yale University.

This volume includes a discussion of the factors affecting the mechanical properties and methods of timber testing.

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THE PRINCIPLES OF HANDLING WOODLANDS.

By Henry Solon Graves, The Forester, U. S. Department of Agriculture.

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THE THEORY AND PRACTICE OF WORKING PLANS (Forest Organization)

By Professor A. B. Recknagel, Cornell University.

In preparing this book the author has constantly kept in mind the experience which he gained while doing active work for the Forest Service in various parts of the United States.

235 pages, 6x9, illustrated. **Cloth, $2.00 net.**

CANADIAN FORESTRY JOURNAL,

119 Booth Building, Ottawa.

Illustrated Lectures in French

By an arrangement recently completed between the Canadian Forestry Association and Mr. G. C. Piché, Chief of the Quebec Forest Service, a series of illustrated public lectures will be delivered in Quebec Province beginning early in the New Year and extending through February. Where advisable, bi-lingual addresses will be given, but in communities where French-speaking citizens predominate a French lecturer will be exclusively employed. The Canadian Forestry Association will manage the undertaking, supplying stereopticon and equipment, advertising matter, etc., without cost to local authorities.

The first lectures will be held at Windsor, Stoke Centre, St. Camille, and St. George, in the Eastern Townships, and other dates will be arranged so as to reach the greatest number of people and at centres which promise best results. Suggestions as to other localities, dates, etc., are invited by the Secretary.

The topics will follow much the same lines as other lectures given through the Association, a discussion of the extent and value of the forest possessions, the importance of the wood-using industries, the public losses through forest fires, and how to eliminate them, the care of woodlots, etc., etc. One hundred lantern slides will be used.

A Forest-Book for French Children.

The Canadian Forestry Associatin will have ready for distribution about January 1st a 32-page illustrated booklet in French telling of the forest, its dependent industries, the origin of forest fires, the care and value of the woodlot, etc., etc.

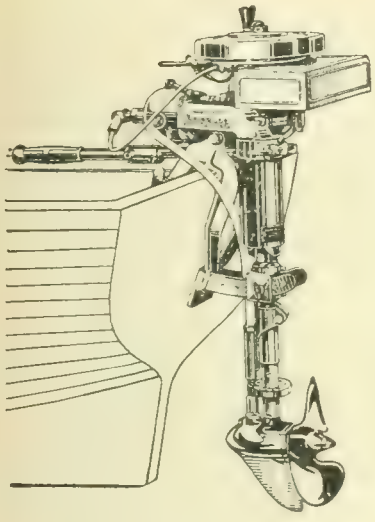
There will be about 30 photographic engravings, the whole resembling very closely the "Boy Scout's Forest-Book" which had a circulation throughout the Dominion of 15,000 copies, going to every Boy Scout and hundreds of school teachers and pupils.

Those who can place a number of these French booklets in the hands of French-speaking boys and girls of 13 years and upward are asked to correspond with the Secretary of the Association.

As the Association's funds are able to provide for only 5,000 copies, any member of the Association may undertake by private subscription to greatly increase this number.

The recent announcement that $1,000,000 will be spent by the Dominion Government in the construction of an aeroplane factory, probably at Toronto, lends special interest to the report that the proposed aeroplane station to be established by the United States Government at Duluth, Minnesota, will be made the basis of an aero forest fire patrol system. The state forester of Wisconsin has already secured excellent results from the use of an aeroplane for the patrol of a large area of forest in the northern part of the state, and it is expected that similar good results will be secured in Minnesota, from the co-operative arrangement which has been approved by the commander of the Minnesota Naval Militia. The main object of this patrol will, of course, be the prompt discovery and location of forest fires. The telephone system which has been developed will enable the forest rangers to be notified at once in case a fire is located, so that they can at once take all necessary steps for its extinguishment. State Forester Cox, of Minnesota, estimates that at least $45,000 can be saved the state annually with the installation of an air patrol.

In view of the great importance of Ontario as a timber-producing province, and of the enormous damage that has resulted in the past from forest fires, it is to be hoped that some co-operative arrangement may be possible, in connection with the testing of machines and training of men, under which a thorough test may be made of the practicability of using aeroplanes.



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Negligence.

(Montreal Witness.)

An expert on forestry told the Dominions royal commission the other day at its Montreal sitting, that within twenty-five years Canada would have lost its wood pulp supply if conservation measures are not adopted meanwhile. This is not the first or second time we have heard something like this from authorities more or less distinguished. In fact we have heard it so frequently that possibly we have come to regard it as a "wolf" cry and for that reason take little notice of it.

It is many years since the Dominion conservation commission first gave this country warning on this subject. Since then the warning has been repeated times without number, and is still being repeated. Why should this be so? Of what value is a conservation commission if no notice is taken of its reports and warnings? Where are the wise men in governments of Canada, Dominion and provincial, who should be attending to this most important matter? What right have the people of this generation to continue squandering the heritage which should be merely used by them and handed down to posterity richer than ever before?

The expert who speaks to-day says that three things are working to bring our pulp wood forests to naught. One is the absence of any plan of reforestation, another the absence of any adequate system of fire protection, and the third is the great waste which is permitted by those who should know better in almost every forest area. In this connection he states that thirty per cent. of the pulp woods of Canada have been burned over and rendered useless for generations to come.

Evidently there is something radically wrong somewhere; something lacking. And it is surely time the people of Canada should insist upon their governments enacting such legislation as may be necessary to prevent early bankruptcy in this decidedly valuable department of the country's resources.

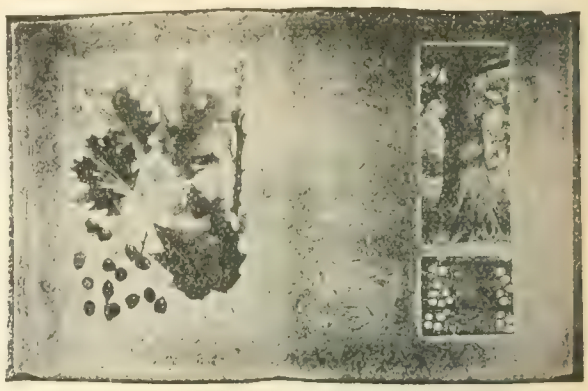
MONTREAL STAR ON WASTE OF THE FORESTS.

In the report of the Canadian Forestry Association for the current year, it is very clearly shown that with better guardianship of forests the danger of conflagrations would be immensely reduced. "The point we wish to emphasize," says the report, "is that the cost of vigorous and efficient forest guarding is a mere trifle compared with the amount of timber which efficient patrolling, etc., would save." Statistics in the report prove that in 1916 the forest fire losses totalled over nine million dollars. The fact is dwelt upon that in districts where the patrol service is satisfactory, fires are nearly unknown, but that the menace to the forest wealth is always in districts where the patrolling is poor, spasmodic and lacks efficiency. Facts such as these should be taken into serious consideration by the Government. The immense boon of forests is recognized in all countries, and the most earnest efforts are made to preserve timber. As to the origin of most of the forest fires in this country, facts show they are due very largely to carelessness. Laws are now being enacted in various provinces making it incumbent on settlers to get special permission before proceeding to clear spaces by the use of fire. It has been a matter of the deepest regret in many countries that adequate steps were not taken to protect forests, and they are setting aside immense areas for tree planting; but it will take generations before most of the trees reach maturity and can be of any commercial value. It behooves Canada to take this object lesson to heart.

Bricks Without Straw.

According to a despatch from Watertown, N.Y., a new process of making news-print without use of sulphite is to revolutionize the paper-making industry. The despatch appeared in the daily press a day or two ago as follows:

"Watertown, N.Y., November 28.—A process of news-print paper manufacturing that is expected to revolutionize the paper making industry was proclaimed a success here to-day. It



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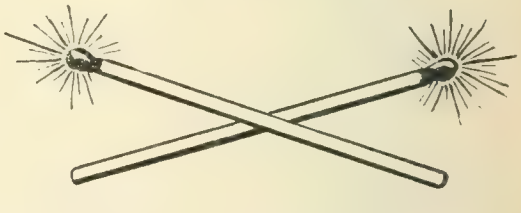

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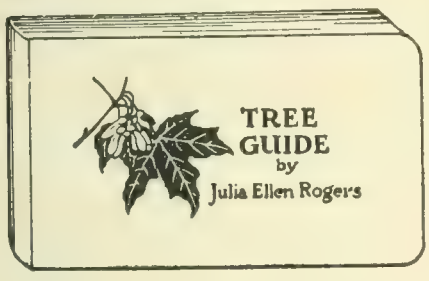

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BOOK DEPARTMENT, CANADIAN FORESTRY JOURNAL

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is known as the 'Lefebvre system,' and is the invention of Henry Lefebvre, of this city. Paper manufactured by this system in the mills of the St. Regis Paper Company near here was used by the Watertown Standard to-day in the first practical test.

"The system consists of washing the ground wood fibres as they come from the grinders with pure water into even lengths ready to be made into paper, thus making the use of sulphite unnecessary, sulphite being one of the most expensive items of paper manufactured to-day.

"Paper experts claim that the paper is of a better grade than that now used, and that a cheaper grade of ink can be used with equal results. The inventor says that this system of manufacture will reduce the cost of manufacturing one-half by abolishing the use of sulphite and doing away with much of the labor entailed thereby. Mr. Lefebvre was offered $250,000 for his invention, by the International Paper Company, which he refused."

To which the Pulp and Paper Magazine of Montreal adds:

"Ever since paper-making commenced on this continent experiments have been made to have ground-wood fill the bill without any aid from sulphite, but it has never been found to have strength enough, or flexibility enough to adapt itself to the modern high speed news machines. It is a well-known fact that there are hundreds of experiments made in our laboratories, but only one out of several hundred will have an economic value.

"Europe has been working on this scheme for years, and up to the present time all our improvements in connection with fibres have come from that continent. They manufacture one million tons of fibre per year, and have never spared any expense either in factory or laboratory to devise schemes which would lessen the cost of their annual output. With all due respect to the inventor at Watertown, it looks very much as if his much advertised find was not of a practical nature." '

Effect of Forests on Stream Flow

Experience has proved that the forest works efficaciously against many dangers resulting from the elements let loose, such as avalanches, falls of stones, erosion, earthslides, inundations. These are facts admitted and indisputable, but how and in what measure does the forest exercise this moderating action upon the destructive power of water? How can it lessen the destruction from inundations? It is in order to attempt an answer to this leading question that the Swiss Federal Station of Forest Research in 1900 installed an observing station in the basin from which two streams of the Bernese Emmental are fed. These streams, tributaries of the Hornbach, are located in the territory of the commune of Summiswald-Wasen, on the north-west slope of the Napf. The geological formation is fissured pudding-stone which decomposes readily. One of the basins, with an extent of 140 acres, is completely wooded. The other with an area of 175 acres has only a small average of wooded district, about 30 per cent.. The forest is composed of spruce and of alder bushes. The measurement of the precipitation, rain and snow, takes place regularly throughout the year. In each of the basins there have been installed three rain gauge stations at different altitudes. At the junction of the two streams with the Hornbach certain apparatus registers automatically every five minutes day and night the volume of the water flowing.

The Research Station has: 1. In case of storms accompanied with heavy rains the maximum outflow in the wooded valley is from 30 to 50 per cent. less than that from the other valley, and there is another beneficial circumstance from the action of the forest,

that this maximum flow is produced later in the wooded basin than in the other. 2. In the long periods of drought (the summers of 1904, 1906, 1908 and 1911) the wooded district gave without interruption a flow of water while in the denuded valley the stream dried up and all the springs ceased although at a normal time they have an abundant flow.

Attendance at Forest Protection Lectures

That the interest of Canadians in the subject of Canada's forests is particularly keen during war time has been proven by the large audiences which have been present at the illustrated addresses given by the Secretary of the Canadian Forestry Association during October and November.

Attendance was excellent at Queen's University, Kingston; University of Bishop's College, Lennoxville; Macdonald College, Ste. Anne de Bellevue; St. Andrew's College, Toronto; luncheon of the Montreal Electrical Association, and other engagements.

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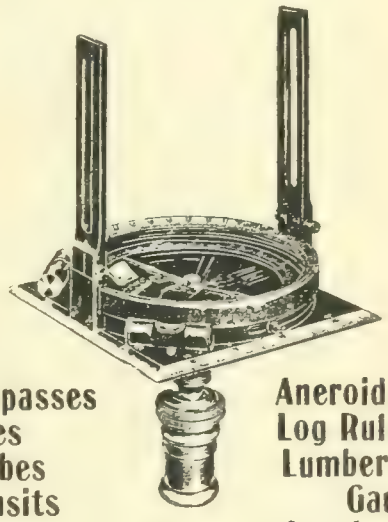

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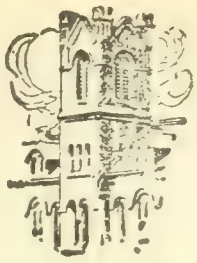
A Warning re B. C. Timber.

(From a Letter in the Vancouver "Province.")

Sir,—With reference to the agricutlural problem in the Coast or large timber sections of British Columbia, why not face the facts as they appear and admit that the land, except in the vicinity of towns and cities, is not worth the cost of clearing and that we cannot expect to get returned soldiers or immigrants to undertake it. No one could compete with the Prairies in raising grain on such costly land and no Government would have any excuse for spending the funds of the Province in such a costly venture.

The future of this Province rests largely on its great timber and mineral wealth and its fisheries, but even these great resources can be so exploited as to do little for the permanent good of the country. Minerals can be shipped into the States in its crudest form, and with the least possible leakage in this Province and leave us nothing but a hole in the ground, and our timber can be cut and shipped in the rough and leave us nothing but devastated forests and stump land while supplying the base for wealth in other lands, where it is turned into the finished product.



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We can learn some lessons from the Southern States which fifty years ago were considered very rich in timber, but to-day it can hardly supply the poor quality that is needed for box manufacture. The timber of the South made great fortunes in the North, where it was manufactured, but the South is left with only denuded forest land, much of which can be bought for $3 or $4 an acre, and few sales at that. The United States Government is now spending millions of dollars to reforest mountain slopes from which timber was cut in order to prevent floods.

The forests of British Columbia are sufficient for all time if properly used, and will maintain a great population in the wood working industries with a little encouragement from the Government, but we should go very slowly to clear more land than can be profitably put in cultivation.

W. J. ALDER.

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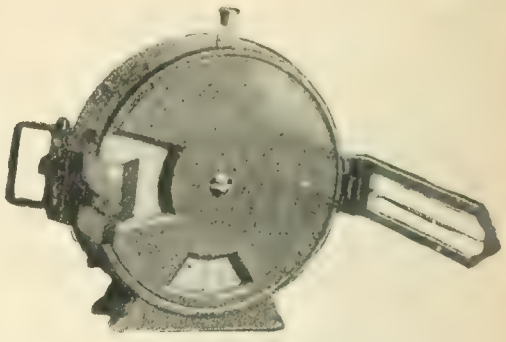

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